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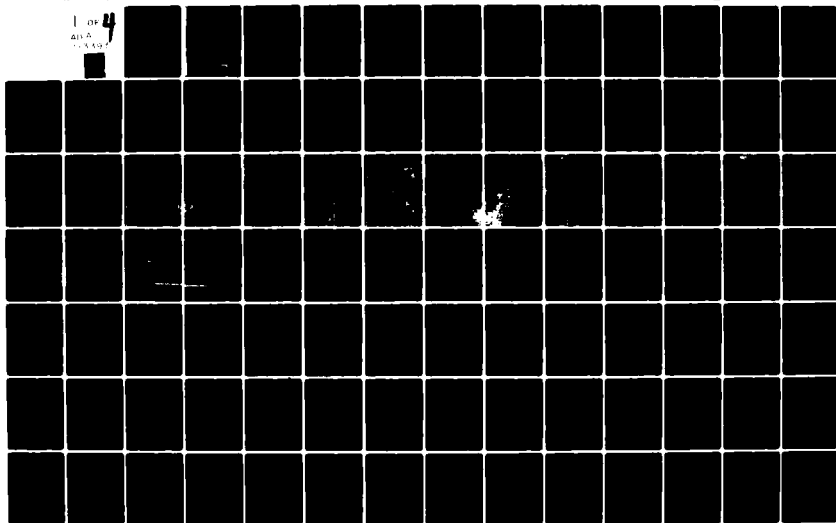
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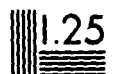
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Resolution Test Chart
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**MX SITING INVESTIGATION
GEOTECHNICAL EVALUATION**

AD A113393

**VERIFICATION STUDY
WAH WAH VALLEY, UTAH
VOLUME II - GEOTECHNICAL DATA**

**PREPARED FOR
BALLISTIC MISSILE OFFICE (BMO)
NORTON AIR FORCE BASE, CALIFORNIA**

FUGRO
NATIONAL, INC.
Consulting Engineers and Geologists

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report contains the field data + laboratory test results from the Verification investigation of Wasatch Valley. Includes basic data consisting of depth to rock, depth to water, seismic refraction surveys, electrical resistivity surveys, boring and trench logs, and soil profiles.		

MX SITING INVESTIGATION
GEOTECHNICAL EVALUATION
VERIFICATION STUDY - WAH WAH VALLEY
UTAH
VOLUME II - GEOTECHNICAL DATA

Prepared for:

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24 March 1981

FOREWORD

This volume of geotechnical data was compiled for the Department of the Air Force, Ballistic Missile Office (BMO), in compliance with Contract No. F04704-80-C-0006, CDRL Item 004A6. It contains the field data and laboratory test results from the Verification investigation of Wah Wah Valley. A synthesis of these data are available in Volume I (FN-TR-27-WA-I).

The data in each section of this volume are preceded by an explanation of the format and terms used in the compilation.

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	1.0 <u>ACTIVITY AND GEOLOGIC STATION DATA</u>	
II-1-1	Activity Location Map, Wah Wah Valley, Utah	In Pocket at end of Section
	10.0 <u>CONE PENETROMETER TEST RESULTS</u>	
II-10-1	Cone Penetrometer Test Results, Wah Wah Valley, Utah	In Pocket at end of Section

1.0 ACTIVITY MAP AND GEOLOGIC STATION DATAExplanation:

Locations of all field investigations are shown in Drawing II-1-1, Activity Location Map (in pocket). The geodetic and Universal Transverse Mercator (UTM) coordinates of all activities are listed in Table II-1-1.

Geologic stations were established at selected locations throughout the valley at which detailed descriptions of surficial basin-fill deposits or rock were recorded. All data taken on surficial basin-fill units at the geologic stations are listed in Table II-1-2, and an explanation of the column headings in the table is given below. An example of the field data sheet is shown on Figure II-1-1. At stations where rock descriptions were made, only geologic unit designations are listed. A general explanation of all geologic unit symbols used in Verification studies is included at the end of this section.

Column Heading
Table II-1-2Explanation

Station Number	Geologic stations are numbered sequentially. (e.g., NWAG001; N= Nevada-Utah Study Area; WA= Valley abbreviation [Wah Wah]; G= Geology Station).
Geol. Unit	Generalized mapped geomorphic unit (see explanation below). The grain-size designations (s, g, and f) indicate sand, gravel, and fines, respectively.
MPS (mm)	Average Maximum Particle Size in millimeters.
Grain Size (%B, %C, %G, %S, %F)	Estimated particle size distribution using the Unified Soil Classification System. Percentages of boulders (%B) and cobbles (%C) are based on the entire deposit, whereas percentages of gravel (%G), sand (%S), and fines (%F)

are taken only on the fraction composed of particles less than three inches (76 mm) in diameter. Note: The symbol Ø (occasional) indicates between one and five percent; zero indicates zero to one percent.

*	Laboratory analyses of selected soil samples using the Unified Soil Classification System.
USCS	Soil class according to the Unified Soil Classification System.
Munsell Color	Soil color based on standard Munsell Soil Color Charts.
Source Rock Types	Rock types of coarse clasts (gravel) listed in order of abundance.
Physical Properties	Data listed in columns 6 through 15 address specific soil properties. These are listed below in parentheses following the column heading number and are also listed at the bottom of Table II-1-1. Data are coded with each numerical entry referring to a specific soil condition as listed below.

6 (Grain Shape)	1) Angular, 2) Subangular, 3) Subrounded, 4) Rounded, 5) Well rounded
7 (Moisture Content)	1) Dry, 2) Slightly Moist, 3) Moist, 4) Very Moist, 5) Wet
8 (Plasticity of Fines)	1) None, 2) Low, 3) Medium, 4) High
9 (Consistency)	Coarse grained: 1) Very Loose, 2) Loose, 3) Medium Dense, 4) Dense, 5) Very Dense Fine grained: 1) Soft, 2) Firm, 3) Stiff, 4) Hard
10 (Structure)	1) Non-stratified, 2) Stratified, tabular, 3) Stratified, other (lensed, cross bedded, discontinuous beds)
11 (Cementation-Induration)	1) None, 2) Weak, 3) Moderate, 4) Strong
12 (Depth to Cemented Layer)	Depth to layer (in centimeters) exhibiting cementation-induration described in Column 11 (above)

13 (Weathering of clasts)	1) Fresh, 2) Slight, 3) Moderate, 4) Very
14 (Soil Profile Development)	1) None (A-C profile), 2) Poor (incipient B-horizon), 3) Well (prominant B-horizon)
15 (Caliche Development)	1) None, 2) Stage I, 3) Stage II, 4) Stage III, 5) Stage IV
Terrain	Terrain information at the data location is broken into the following categories:
Drainage Depth (ft)	Average depth of drainages (in feet)
Drainage Width (ft)	Average width of drainages (in feet)
Slope (%)	Average slope of ground surface (in percent grade)
Sample	Number of samples taken

GENERALIZED GEOLOGIC UNITS

Explanation

Surficial Basin-fill Units

- A1 Younger Fluvial Deposits - Major recent stream-channel and flood-plain deposits.
- A2 Older Fluvial Deposits - Older incised stream-channel and flood-plain deposits in elevated terraces bordering major recent drainages.
- A3 Eolian Deposits - Windblown deposits of sand occurring as either thin sheets (A3s) or dunes (A3d).
- A4 Playa and Lacustrine Deposits - Deposits occurring in modern, active playas (A4) or in either inactive playas or older lake beds and abandoned shorelines associated with extinct lakes (A4o).
- A5 Alluvial Fan Deposits - Alluvial deposits consisting of debris flow and water-laid alluvium near mountain fronts, grading into predominantly water-laid alluvium deposited in shifting distributary channels near the basin center. Younger (A5y), intermediate (A5i), and older (A5o) alluvial fans are differentiated by surface soil development, terrain conditions, and present depositional/erosional environment.

Grain sizes of these deposits (except A3 deposits, which are exclusively sandy) are indicated by a single letter (f, s, or g) following the geologic unit symbol. These letters indicate the predominant grain size and range of soil types according to the Unified Soil Classification System.

f - fine-grained clays and silts (ML, CL, MH, CH)

s - sands (SP, SW, SM, SC)

g - gravels (GP, GW, GM, GC)

ROCK UNITS

- I Igneous (undifferentiated). Rocks formed by solidification of a molten or partially molten mass.
 - I1 Intrusive - Plutonic rocks formed by solidification of molten material beneath the surface (e.g., granite, granodiorite, diorite, gabbro).
 - I2 Extrusive (intermediate and acidic) - Volcanic rocks of intermediate and acidic composition formed by solidification of molten material at or near the surface (e.g., rhyolite, latite, dacite, andesite).
 - I3 Extrusive (basic) - Volcanic rocks of basic composition, generally formed by solidification of molten materials at or near the surface (e.g., basalt).
 - I4 Extrusive (pyroclastic) - Rocks formed by accumulation of volcanic ejecta (e.g., ash, tuff, welded tuff, agglomerate).
- S Sedimentary (undifferentiated) - Rocks formed by accumulation of clastic solids, organic solids, and/or chemically precipitated minerals.
 - S1 Arenaceous and/or Siliceous Rocks - Composed of sand-size particles (e.g., sandstone, orthoquartzite) or of cryptocrystalline silica (e.g., opal, chert).
 - S2 Carbonate Rocks - Composed predominantly of calcium-carbonate detritus or chemical precipitates (e.g., limestone, dolomite, chalk).

- S3 Argillaceous Rocks - Composed of clay and silt-sized particles (e.g., siltstone, shale, claystone).
- S4 Evaporite Rocks - Precipitated from solution as a result of evaporation (e.g., halite, gypsum, anhydrite, sylvite).
- S5 Coarse Clastic Rocks - Composed of gravel-sized or larger clasts (e.g., conglomerate, breccia).
- M Metamorphic (undifferentiated) - Rocks formed through recrystallization in the solid state of preexisting rocks by heat and pressure (e.g., gneiss, schist, hornfels, metaquartzite).

FN-TR-27-WA-2

WAH WAH VALLEY ACTIVITY LOCATIONS

ACT ID.	GEODETTIC COORD.				UTM COORD.	
	LAT.		LONG		ZONE 12	
	DEG	MIN	DEG	MIN	N (KM)	E (KM)

BORING SITES						

WA- B01	38	41.02	113	22.38	4284.15	293.58
WA- B02	38	35.63	113	20.65	4274.10	295.84
WA- B03	38	33.25	113	25.05	4269.86	289.33
WA- B04	38	26.27	113	24.45	4256.94	289.87
WA- B05	38	29.57	113	28.42	4263.07	284.25
WA- B06	38	44.38	113	23.11	4290.38	292.69
WA- B07	38	42.28	113	17.13	4286.28	301.26

CPT SITES

WA- C01	38	43.42	113	19.93	4288.48	297.25
WA- C02	38	43.81	113	20.88	4299.24	295.90
WA- C03	38	44.11	113	22.01	4289.84	294.27
WA- C04	38	44.38	113	23.11	4290.38	292.69
WA- C05	38	29.69	113	29.04	4263.44	283.37
WA- C06	38	29.51	113	28.42	4263.07	284.25
WA- C07	38	28.98	113	27.43	4262.07	285.67
WA- C08	38	28.56	113	26.50	4261.25	286.99
WA- C09	38	28.25	113	25.25	4260.64	288.81
WA- C10	38	27.89	113	24.07	4259.92	290.50
WA- C11	38	27.07	113	24.25	4258.41	290.20
WA- C12	38	26.27	113	24.45	4256.94	289.87
WA- C13	38	25.45	113	25.35	4255.45	288.52
WA- C14	38	24.56	113	26.25	4253.84	287.16
WA- C15	38	24.10	113	26.87	4253.02	286.25
WA- C16	38	23.57	113	27.54	4252.05	285.25
WA- C17	38	23.48	113	24.86	4251.80	289.13
WA- C18	38	22.44	113	24.76	4249.86	289.23
WA- C19	38	21.75	113	25.51	4248.61	288.11
WA- C20	38	23.73	113	23.90	4252.22	290.55
WA- C21	38	23.84	113	23.02	4252.38	291.84
WA- C22	38	23.45	113	22.22	4251.63	292.98
WA- C23	38	23.11	113	21.42	4250.97	294.13
WA- C24	38	23.32	113	20.62	4251.33	295.31
WA- C25	38	26.14	113	17.86	4256.44	299.46
WA- C26	38	26.34	113	18.79	4256.85	298.10
WA- C27	38	26.84	113	20.09	4257.82	296.24
WA- C28	38	27.18	113	21.32	4258.50	294.46
WA- C29	38	27.54	113	22.72	4259.22	292.45
WA- C30	38	34.04	113	26.65	4271.39	287.05

GEOGRAPHIC COORDINATES OF ACTIVITIES
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMOTABLE
II-1-1
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FUGRO NATIONAL, INC.

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FN-TR-27-WA-E

WAH WAH VALLEY ACTIVITY LOCATIONS

ACT ID.	GEODETTIC COORD.				UTM COORD.	
	LAT.		LONG.		ZONE 12	
	DEG	MIN	DEG	MIN	N(KM)	E(KM)
WA- C31	38	33.71	113	26.05	4270.75	287.91
WA- C32	38	33.25	113	25.05	4269.86	289.33
WA- C33	38	32.73	113	24.11	4268.87	290.68
WA- C34	38	31.73	113	23.37	4266.99	291.70
WA- C35	38	31.54	113	22.43	4266.60	293.06
WA- C36	38	31.53	113	20.83	4266.53	295.38
WA- C37	38	31.85	113	20.08	4267.10	296.48
WA- C38	38	35.63	113	20.65	4274.10	295.84
WA- C39	38	35.84	113	18.39	4274.41	299.14
WA- C40	38	35.88	113	19.01	4274.50	298.24
WA- C41	38	35.94	113	19.79	4274.65	297.10
WA- C42	38	36.08	113	21.75	4274.97	294.27
WA- C43	38	36.11	113	22.76	4275.08	292.80
WA- C44	38	37.00	113	22.95	4276.73	292.57
WA- C45	38	37.65	113	23.03	4277.93	292.49
WA- C46	38	38.44	113	23.30	4279.39	292.13
WA- C47	38	40.44	113	17.83	4282.89	300.16
WA- C48	38	40.74	113	18.93	4283.48	298.58
WA- C49	38	40.81	113	19.95	4283.66	297.10
WA- C50	38	40.89	113	21.08	4283.85	295.47
WA- C51	38	41.02	113	22.38	4284.15	293.58
WA- C52	38	41.07	113	23.53	4284.28	291.92
WA- C53	38	41.19	113	24.59	4284.53	290.39
WA- C54	38	41.22	113	25.77	4284.63	288.68
WA- C55	38	40.83	113	26.82	4283.95	287.14
WA- C56	38	40.54	113	27.60	4283.45	285.99
WA- C57	38	39.69	113	29.93	4281.97	282.57
WA- C58	38	40.01	113	29.22	4282.53	283.61
WA- C59	38	40.23	113	28.41	4282.91	284.81
WA- C60	38	43.14	113	19.09	4287.94	298.46
WA- C61	38	42.71	113	17.99	4287.10	300.04
WA- C62	38	42.28	113	17.13	4286.28	301.26
WA- C63	38	42.10	113	15.96	4285.90	302.94
WA- C64	38	41.87	113	14.92	4285.43	304.44
WA- C65	38	41.69	113	14.05	4285.08	305.70
WA- C66	38	41.83	113	12.72	4285.28	307.62
WA- C67	38	41.97	113	11.96	4285.53	308.74
WA- C68	38	41.89	113	7.53	4285.22	315.16
WA- C69	38	41.53	113	8.78	4285.16	313.34
WA- C70	38	41.76	113	9.93	4285.07	311.68
WA- C71	38	41.87	113	11.05	4285.30	310.06
WA- C72	38	29.86	113	29.40	4284.76	282.95

GEOGRAPHIC COORDINATES OF ACTIVITIES
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMOTABLE
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FUGRO NATIONAL, INC.

WAH WAH VALLEY ACTIVITY LOCATIONS

ACT ID.	GEODETTIC COORD.				UTM COORD.	
	LAT.		LONG.		ZONE 12	
	DEG	MIN	DEG	MIN	N(KM)	E(KM)

FIELD CBR TESTS

WA- F01	38	28. 25	113	25. 25	4260. 64	288. 81
WA- F02	38	27. 54	113	22. 72	4259. 22	292. 45
WA- F03	38	24. 56	113	26. 25	4253. 84	287. 16
WA- F04	38	26. 27	113	24. 45	4256. 94	289. 87
WA- F05	38	40. 74	113	18. 93	4283. 48	298. 58
WA- F06	38	37. 00	113	22. 95	4276. 73	292. 57
WA- F07	38	35. 63	113	20. 65	4274. 10	295. 84
WA- F08	38	32. 73	113	24. 11	4268. 87	290. 68

GEOLOGIC STATIONS

WA-GS01	38	43. 49	113	19. 91	4288. 62	297. 28
WA-GS02	38	41. 26	113	25. 50	4284. 70	289. 08
WA-GS03	38	41. 06	113	22. 11	4284. 20	293. 98
WA-GS04	38	41. 01	113	19. 40	4284. 01	297. 91
WA-GS05	38	42. 89	113	19. 93	4287. 51	297. 23
WA-GS06	38	43. 72	113	20. 55	4289. 07	296. 37
WA-GS07	38	43. 94	113	22. 13	4289. 53	294. 10
WA-GS08	38	43. 02	113	21. 14	4287. 79	295. 48
WA-GS09	38	44. 27	113	21. 09	4290. 11	295. 61
WA-GS10	38	41. 89	113	15. 46	4285. 50	303. 66
WA-GS11	38	41. 58	113	13. 60	4284. 85	306. 34
WA-GS12	38	45. 89	113	17. 97	4292. 99	300. 21
WA-GS13	38	43. 26	113	18. 36	4288. 14	299. 53
WA-GS14	38	44. 05	113	18. 13	4289. 58	299. 90
WA-GS15	38	38. 83	113	28. 63	4280. 33	284. 41
WA-GS16	38	41. 42	113	25. 94	4285. 01	288. 44
WA-GS17	38	39. 57	113	30. 37	4281. 76	281. 93
WA-GS18	38	39. 13	113	29. 57	4280. 93	283. 06
WA-GS19	38	39. 62	113	24. 42	4281. 63	290. 56
WA-GS20	38	38. 29	113	22. 03	4279. 08	293. 97
WA-GS21	38	41. 80	113	10. 33	4285. 15	311. 09
WA-GS22	38	39. 95	113	12. 48	4281. 80	307. 89
WA-GS23	38	39. 45	113	13. 00	4280. 90	307. 12
WA-GS24	38	40. 54	113	17. 93	4283. 08	300. 02
WA-GS25	38	34. 22	113	23. 35	4271. 60	291. 85
WA-GS26	38	33. 36	113	22. 38	4269. 98	293. 23
WA-GS27	38	33. 91	113	21. 00	4270. 93	295. 25
WA-GS28	38	33. 86	113	19. 76	4270. 80	297. 05
WA-GS29	38	33. 83	113	19. 43	4270. 74	297. 53

GEOGRAPHIC COORDINATES OF ACTIVITIES
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMOTABLE
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FUGRO NATIONAL, INC.

FN-TR-27-WA-8

WAH WAH VALLEY ACTIVITY LOCATIONS

ACT ID.	GEODETTIC COORD.				UTM COORD.	
	LAT.		LONG.		ZONE 12	
	DEG	MIN	DEG	MIN	N(KM)	E(KM)
WA-GS30	38	31.42	113	21.72	4266.36	294.09
WA-GS31	38	32.13	113	18.53	4267.55	298.76
WA-GS32	38	32.93	113	20.56	4269.10	295.85
WA-GS33	38	37.38	113	17.60	4277.23	300.35
WA-GS34	38	37.76	113	19.38	4278.00	297.78
WA-GS35	38	25.83	113	20.62	4255.98	295.42
WA-GS36	38	25.49	113	19.34	4255.29	297.27
WA-GS37	38	24.94	113	20.71	4254.33	295.25
WA-GS38	38	23.38	113	20.16	4251.43	295.98
WA-GS39	38	20.32	113	22.40	4245.85	292.57
WA-GS40	38	24.11	113	22.57	4252.87	292.50
WA-GS41	38	25.21	113	23.27	4254.92	291.53
WA-GS42	38	27.04	113	24.17	4258.35	290.31
WA-GS43	38	25.04	113	25.13	4254.69	288.83
WA-GS44	38	23.73	113	25.98	4252.30	287.52
WA-GS45	38	22.52	113	24.74	4250.01	289.27
WA-GS46	38	25.53	113	28.14	4255.70	284.46
WA-GS47	38	27.61	113	27.44	4259.52	285.59
WA-GS48	38	28.15	113	27.38	4260.52	285.71
WA-GS49	38	26.31	113	29.02	4257.19	283.22
WA-GS50	38	31.93	113	24.44	4267.40	290.16
WA-GS51	38	33.06	113	24.50	4269.50	290.13
WA-GS52	38	31.08	113	26.28	4265.91	287.44
WA-GS53	38	30.29	113	28.21	4264.51	284.60
WA-GS54	38	30.20	113	31.04	4264.45	280.49
WA-GS55	38	36.50	113	23.12	4275.81	292.30
WA-GS56	38	36.37	113	23.78	4275.59	291.33
WA-GS57	38	36.13	113	24.78	4275.19	289.87
WA-GS58	38	35.12	113	27.15	4273.41	286.37
WA-GS59	38	34.28	113	27.85	4271.89	285.33
WA-GS60	38	30.19	113	30.22	4264.41	281.68
WA-GS61	38	29.15	113	27.06	4262.36	286.21
WA-GS62	38	29.10	113	23.06	4262.12	292.03
WA-GS63	38	30.20	113	21.46	4264.10	294.41
WA-GS64	38	26.20	113	18.11	4256.57	299.09
WA-GS65	38	27.03	113	20.17	4258.17	296.14
WA-GS66	38	35.94	113	23.34	4274.78	291.95
WA-GS67	38	38.80	113	23.54	4280.07	291.80
WA-GS68	38	38.68	113	25.92	4279.94	298.34
WA-GS69	38	25.66	113	26.18	4255.87	287.33
WA-GS70	38	22.99	113	28.11	4251.02	284.39
WA-GS71	38	19.13	113	23.50	4243.70	290.92

GEOGRAPHIC COORDINATES OF ACTIVITIES
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMOTABLE
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FUGRO NATIONAL, INC.

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WAH WAH VALLEY ACTIVITY LOCATIONS

ACT ID.	GEODETTIC COORD.				UTM COORD.	
	LAT.		LONG.		ZONE 12	
	DEG	MIN	DEG	MIN	N(KM)	E(KM)
WA-GS72	38	23.94	113	20.82	4252.48	295.04
WA-GS73	38	14.70	113	24.78	4235.55	288.83

REFRACTION LINES

WA-S01	38	44.11	113	22.01	4289.84	294.27
WA-S02	38	29.86	113	29.40	4263.76	282.85
WA-S03	38	28.98	113	27.43	4262.07	285.67
WA-S04	38	23.32	113	20.62	4251.33	295.31
WA-S05	38	26.14	113	17.86	4256.44	299.46
WA-S06	38	23.57	113	27.54	4252.05	285.25
WA-S07	38	20.91	113	25.14	4247.05	288.60
WA-S08	38	20.38	113	22.74	4245.97	292.08
WA-S09	38	28.29	113	27.28	4260.79	285.86
WA-S10	38	26.51	113	29.61	4257.58	282.38
WA-S11	38	39.69	113	29.93	4281.97	282.57
WA-S12	38	38.44	113	23.30	4279.39	292.13
WA-S13	38	32.06	113	19.22	4267.45	297.75
WA-S14	38	34.27	113	27.56	4271.85	285.75
WA-S15	38	18.21	113	23.96	4242.02	290.19
WA-S16	38	41.69	113	14.05	4285.08	305.70
WA-S17	38	43.14	113	19.09	4287.94	298.46
WA-S18	38	41.89	113	7.53	4285.22	315.16
WA-S19	38	39.18	113	10.83	4280.32	310.25
WA-S20	38	39.98	113	13.29	4281.88	306.73
WA-S21	38	40.05	113	14.42	4282.06	305.08

RESISTIVITY LINES

WA-R01	38	44.11	113	22.01	4289.84	294.27
WA-R02	38	29.86	113	29.40	4263.76	282.85
WA-R03	38	28.98	113	27.43	4262.07	285.67
WA-R04	38	23.32	113	20.62	4251.33	295.31
WA-R05	38	26.14	113	17.86	4256.44	299.46
WA-R06	38	23.57	113	27.54	4252.05	285.25
WA-R07	38	20.91	113	25.14	4247.05	288.60
WA-R08	38	20.38	113	22.74	4245.97	292.08
WA-R09	38	28.29	113	27.28	4260.79	285.86
WA-R10	38	26.51	113	29.61	4257.58	282.38
WA-R11	38	39.69	113	29.93	4281.97	282.57
WA-R12	38	38.44	113	23.30	4279.39	292.13
WA-R13	38	32.06	113	19.22	4267.45	297.75

GEOGRAPHIC COORDINATES OF ACTIVITIES
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMOTABLE
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FUGRO NATIONAL, INC.

WAH WAH VALLEY ACTIVITY LOCATIONS

ACT ID.	GEODETTIC COORD.				UTM COORD.	
	LAT.		LONG.		ZONE 12	
	DEG	MIN	DEG	MIN	N(KM)	E(KM)
WA- R14	38	34.27	113	27.56	4271.85	285.75
WA- R15	38	18.21	113	23.96	4242.02	290.19
WA- R16	38	41.69	113	14.05	4285.08	305.70
WA- R17	38	43.14	113	19.09	4287.94	298.46
WA- R18	38	41.89	113	7.53	4285.22	315.16
WA- R19	38	39.18	113	10.83	4280.32	310.25
WA- R20	38	39.98	113	13.29	4281.88	306.73
WA- R21	38	40.05	113	14.42	4282.06	305.08

SURFICIAL SOIL SAMPLES

WA-CS01	38	43.42	113	19.93	4288.48	297.25
WA-CS04	38	44.38	113	23.11	4290.38	292.69
WA-CS05	38	29.69	113	29.04	4263.44	283.37
WA-CS08	38	28.56	113	26.50	4261.25	286.99
WA-CS10	38	27.89	113	24.07	4259.92	290.50
WA-CS11	38	27.07	113	24.25	4258.41	290.20
WA-CS13	38	25.45	113	25.35	4255.45	288.52
WA-CS15	38	24.10	113	26.87	4253.02	286.25
WA-CS18	38	22.44	113	24.76	4249.86	289.23
WA-CS20	38	23.73	113	23.90	4252.22	290.55
WA-CS23	38	23.11	113	21.42	4250.97	294.13
WA-CS26	38	26.34	113	18.79	4256.85	298.10
WA-CS28	38	27.18	113	21.32	4258.50	294.46
WA-CS30	38	34.04	113	26.65	4271.39	287.05
WA-CS32	38	33.25	113	25.05	4269.86	289.33
WA-CS34	38	31.73	113	23.37	4266.99	291.70
WA-CS37	38	31.85	113	20.08	4267.10	296.48
WA-CS41	38	35.94	113	19.79	4274.65	297.10
WA-CS43	38	36.11	113	22.76	4275.08	292.80
WA-CS45	38	37.65	113	23.03	4277.93	292.49
WA-CS47	38	40.44	113	17.83	4282.89	300.16
WA-CS49	38	40.81	113	19.95	4283.66	297.10
WA-CS52	38	41.07	113	23.53	4284.28	291.92
WA-CS54	38	41.22	113	25.77	4284.63	288.68
WA-CS56	38	40.54	113	27.60	4283.45	285.99
WA-CS58	38	40.01	113	29.22	4282.53	283.61
WA-CS61	38	42.71	113	17.99	4287.10	300.04
WA-CS63	38	42.10	113	15.96	4285.90	302.94
WA-CS65	38	41.69	113	14.05	4285.08	305.70
WA-CS67	38	41.97	113	11.96	4285.53	308.74
WA-CS69	38	41.83	113	8.78	4285.16	313.34

GEOGRAPHIC COORDINATES OF ACTIVITIES
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMOTABLE
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FUGRO NATIONAL, INC.

FN-TR-27-WA-8

WAH WAH VALLEY ACTIVITY LOCATIONS

ACT ID.	GEODETTIC COORD.				UTM COORD.	
	LAT.		LONG.		ZONE 12	
	DEG	MIN	DEG	MIN	N(KM)	E(KM)
WA-CS71	38	41.87	113	11.05	4255.30	310.06

TEST PITS

WA- P01	38	43.81	113	20.88	4289.24	295.90
WA- P02	38	29.86	113	29.40	4263.76	282.85
WA- P03	38	28.98	113	27.43	4262.07	285.67
WA- P04	38	24.56	113	26.25	4253.84	287.16
WA- P05	38	23.45	113	22.22	4251.63	292.98
WA- P06	38	26.84	113	20.09	4257.82	296.24
WA- P07	38	27.54	113	22.72	4259.22	292.45
WA- P08	38	31.53	113	20.83	4266.53	295.38
WA- P09	38	32.73	113	24.11	4268.87	290.68
WA- P10	38	36.08	113	21.75	4274.97	294.27
WA- P11	38	35.84	113	18.39	4274.41	299.14
WA- P12	38	40.83	113	26.82	4283.95	287.14
WA- P13	38	39.69	113	29.93	4281.97	282.57
WA- P14	38	41.19	113	24.59	4284.53	290.39
WA- P15	38	40.89	113	21.08	4283.85	295.47
WA- P16	38	40.74	113	18.93	4283.48	298.58
WA- P17	38	43.14	113	19.09	4287.94	298.46
WA- P18	38	41.87	113	14.92	4285.43	304.44
WA- P19	38	41.83	113	12.72	4285.28	307.62
WA- P20	38	41.76	113	9.93	4285.07	311.68

TRENCH SITES

WA- T01	38	44.11	113	22.01	4287.84	294.27
WA- T02	38	29.51	113	28.42	4263.07	284.25
WA- T03	38	28.25	113	25.25	4260.64	288.81
WA- T04	38	26.27	113	24.45	4256.94	289.87
WA- T05	38	23.57	113	27.54	4252.05	285.25
WA- T06	38	33.48	113	24.86	4251.80	289.13
WA- T07	38	21.75	113	25.51	4248.61	288.11
WA- T08	38	23.84	113	23.02	4252.38	291.84
WA- T09	38	23.32	113	20.62	4251.33	295.31
WA- T10	38	25.14	113	17.86	4256.44	299.46
WA- T11	38	31.54	113	22.43	4266.60	293.06
WA- T12	38	32.06	113	19.22	4267.45	297.75
WA- T13	38	33.71	113	26.05	4270.75	287.91
WA- T14	38	34.27	113	27.56	4271.85	285.75
WA- T15	38	35.63	113	20.65	4274.10	295.84

GEOGRAPHIC COORDINATES OF ACTIVITIES
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMOTABLE
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FUGRO NATIONAL, INC.

24 MAR 81

FN-TR-27-WA-I

WAH WAH VALLEY ACTIVITY LOCATIONS

ACT ID.	GEODETTIC COORD.				UTM COORD.	
	LAT.		LONG.		ZONE 12	
	DEG	MIN	DEG	MIN	N(KM)	E(KM)
WA- T16	38	37.00	113	22.95	4276.73	292.57
WA- T17	38	40.23	113	28.41	4282.91	284.81
WA- T18	38	41.02	113	22.38	4284.15	293.58
WA- T19	38	42.28	113	17.13	4286.28	301.26
WA- T20	38	41.89	113	7.53	4285.22	315.16

WATER WELL SITES

WA- W01	38	40.75	113	18.19	4283.49	299.65
WA- W02	38	26.41	113	24.35	4257.20	290.03
WA- W03	38	23.33	113	24.95	4251.52	289.00
WA- W04	38	23.88	113	23.24	4252.46	291.52
WA- W05	38	21.00	113	23.67	4247.15	290.75
WA- D01	38	43.87	113	15.07	4289.14	304.32
WA- D02	38	43.33	113	8.03	4287.91	314.50
WA- D03	38	43.11	113	11.57	4287.61	309.36
WA- D07	38	42.28	113	17.13	4286.28	301.26
WA-WR01	38	31.53	113	22.06	4266.58	293.60
WA-WR02	38	25.76	113	25.00	4256.00	289.05
WA-WRT2	38	25.61	113	25.16	4255.75	288.81

GEOGRAPHIC COORDINATES OF ACTIVITIES
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMOTABLE
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FUGRO NATIONAL, INC.

24 MAR 81

FN-TR-27-WA-II

SOIL DESCRIPTION															TERRAIN										
STATION NUMBER	GEOLOGIC UNIT	MPS MM	GRAIN SIZE					USCS	MUNSELL COLOR	SOURCE ROCK TYPES	PHYSICAL PROPERTIES										DRAINAGE (FT)		SLOPE DEPTH WIDTH (X)	SAMPLE	
			40	60	100	200	400				6	7	8	9	10	11	12	13	14	15	1	2			
MMG0001	ASYS	60	0	0	0	100	0	SP	7.5YR4/4		3	3	1	2	1	1	3	1	2	1	0.7	3.3	2	1	0
MMG0002	ASYS	50	0	0	0	7	68	25	SH	10.0YR5/4	S2	2	1	1	2	1	1	2	1	1			1	1	1
MMG0003	ASIS	110	0	10	50	40	10	GP-GH	10.0YR4/4		2	1	1	2	1	1	2	1	2	1	6.6	9.8	2	1	0
MMG0004	A40S	20	0	0	0	5	85	10	SP-SH	10.0YR5/4	S1 S2	2	1	1	2	1	1	2	1	1			2	1	0
MMG0005	ASYS	35	0	0	0	5	91	4	SP	10.0YR4/4	S2	2	1	1	1	1	1	2	1	1			2	1	1
MMG0006	A40S	45	0	10	75	20	5	GP-GH	10.0YR5/4	S2 S1	2	1	1	2	3	1	2	1	1	1					1
MMG0007	ASYS	20	0	0	0	5	90	5	SP-SH	10.0YR5/4	S2	2	1	1	1	1	1	2	1	1	1.6	3.3	1	1	0
MMG0008	A40S	30	0	0	0	5	90	5	SP-SH	10.0YR5/4	S2	2	1	1	1	1	1	2	1	2	3.3	3.3	2	1	0
MMG0009	ASYS	110	0	10	60	35	5	GP-GH	10.0YR5/4	S2 S1 I3	3	1	1	3	3	1	2	1	1	1	1.6	3.3	2	1	0
MMG0010	A40S	0	0	0	0	95	5	SP-SH	10.0YR5/4		3	1	1	2	1	1	2	1	1	1					1
MMG0011	S1																								1
MMG0012	A40S	35	0	0	0	5	90	5	SP-SH	10.0YR5/4	S2	2	1	1	1	1	1	2	1	2	1.6	3.3	3	1	0
MMG0013	A40S	30	0	0	0	100	0	SP	10.0YR5/4		2	1	1	1	1	1	2	2	2	1			1	1	0
MMG0014	A40S	0	0	14	44	42	8	SH	10.0YR5/4		1	1	2	8	1	1	1	1	1	1	1.6	3.3	1	1	1
MMG0015	ASIS	160	0	5	33	40	27	SH	10.0YR5/6	S2	2	2	2	2	1	1	2	1	2	1	4.0	20.0	4	1	1
MMG0016	S2																								1
MMG0017	S2																								1
MMG0018	ASIS	100	0	10	25	50	25	SH	10.0YR4/4	S2	2	2	2	3	1	1	2	1	2	1	6.0	480.0	4	1	0
MMG0019	ASYS	70	0	0	31	22	47	SH	10.0YR4/4	S2	2	2	3	3	1	1	2	1	2	1	1.0	3.0	1	1	1
MMG0020	A40S	100	0	0	10	85	5	SP-SH	10.0YR5/4	S2	2	2	2	2	3	1	1	2	1	2	4.0	30.0	1	1	0
MMG0021	A40S	140	0	5	15	49	36	SH	10.0YR4/4	S1	2	2	2	2	2	1	1	2	1	2	8.0	50.0	3	1	1
MMG0022	A40S	70	0	0	49	31	20	SH	10.0YR4/4	S1	2	2	2	2	2	1	1	2	1	2	10.0	180.0	4	1	1
MMG0023	ASIS	170	0	5	60	35	5	GP-GH	10.0YR4/4		2	2	2	2	2	1	1	2	1	3	30.0	380.0	5	1	0
MMG0024	A4 F	70	0	0	0	3	97	SH	10.0YR7/3		1	1	2	7	1	1	1	1	1	1	0.0	0.0	0	1	1
MMG0025	ASYS	70	0	0	2	61	37	SH	10.0YR4/4	S2	2	2	2	1	1	1	2	1	2	1	0.5	1.0	1	1	1
MMG0026	ASYS	10	0	0	2	16	82	SH	10.0YR6/4	S2	2	2	2	2	1	1	1	2	1	2	0.5	1.0	1	1	1
MMG0027	ASYS	20	0	0	2	73	25	SH	10.0YR4/4	S1	2	2	1	1	1	1	2	1	2	1	1.0	2.0	1	1	1
MMG0028	A40S	70	0	0	32	17	31	SH	10.0YR4/4	S1	2	2	1	3	2	1	1	2	1	2					1
MMG0029	ASIS	90	0	0	34	44	22	SH	10.0YR4/4	S1	2	2	1	2	1	1	1	2	1	2	13.0	20.0	11	1	1
MMG0030	ASYS	0	0	0	0	32	68	CL	10.0YR4/4		2	2	2	8	3	1	1	1	1	1	0.5	300.0	1	1	1
MMG0031	S2																								1
MMG0032	A40S	100	0	5	23	47	30	SH	10.0YR4/4	S2	2	2	1	3	1	1	2	1	2	1	4.0	100.0	5	1	1
MMG0033	A40S	140	0	10	11	56	33	SH	10.0YR4/4	S1	2	2	1	3	1	1	2	1	2	1	1.0	4.0	8	1	1
MMG0034	A40S	20	0	0	0	3	85	10	SP-SH	10.0YR6/6	S1	2	2	1	3	1	1	2	1	1	0.3	1.0	2	1	0
MMG0035	ASYS	129	0	0	0	90	5	SP-SH	10.0YR3/4	S2	2	2	1	4	1	3	2	1	3	1	0.5	10.0	2	1	0
MMG0036	I2																								1
MMG0037	ASYS	48	0	0	0	85	10	SP-SH	10.0YR4/4	I2	2	2	1	3	1	4	2	2	2	1			4	1	1
MMG0038	I2																								1
MMG0039	I2																								1
MMG0040	ASYS	5	0	0	10	85	5	SP-SH	10.0YR4/4	I2	2	2	1	3	1	1	2	1	2	1			1	1	0
MMG0041	A40S	13	0	0	0	88	7	SP-SH	10.0YR5/6	I2 I3	2	2	1	3	1	1	2	1	1	1			0	1	0
MMG0042	A40S	33	0	0	0	90	5	SP-SH	10.0YR3/4	I3	2	2	1	3	2	1	2	1	1	1	100.3	1.0	0	1	0
MMG0043	ASYS	100	0	0	12	71	17	SH	10.0YR3/2	I2 I3	2	2	1	3	3	3	2	1	1	1	1.0	3.0	0	1	0
MMG0044	ASIS	39	0	0	0	93	5	SP-SH	10.0YR4/3	I2 S1	2	2	1	1	1	1	2	1	2	1			3	1	0
MMG0045	ASIS	16	0	0	0	90	5	SP-SH	10.0YR4/4	I2 I3	2	2	1	1	1	1	3	1	1	1			1	1	0
MMG0046	ASYS	230	0	0	0	93	5	SP-SH	10.0YR4/4	S2	2	2	1	1	1	1	3	1	1	1			1	1	0
MMG0047	A40S	75	0	0	11	70	19	SH	10.0YR4/4	S2 I2	2	2	1	1	1	1	3	1	2	1	3.0	9.0	2	1	1
MMG0048	I3																								1
MMG0049	ASIS	120	0	5	10	85	5	SP-SH	10.0YR4/6	S2	2	3	1	3	1	3	2	1	2	1	2.0	6.0	3	1	0
MMG0050	A4 F	0	0	0	0	43	57	CL	10.0YR5/4		2	2	2	7	1	1	1	1	1	1	0.5	3.0	1	1	1
MMG0051	A40S	70	0	0	33	47	20	SH	10.0YR3/4	S2	2	2	1	3	1	1	2	1	2	1	4.0	10.0	3	1	1
MMG0052	ASYS	120	0	2	34	46	20	SH	10.0YR4/4	I2	2	2	1	3	1	1	2	1	2	1	3.0	150.0	4	1	1
MMG0053	A1 S	90	0	0	40	60	0	SP	10.0YR3/3	S1	2	2	1	1	2	1	1	1	1	1	15.0	400.0	2	1	1
MMG0054	A50S	80	0	0	45	35	20	SH	10.0YR4/3	S1	2	2	1	2	3	1	1	2	1	2	50.0	400.0	5	1	0
MMG0055	A40S	50	0	0	1	87	12	SP-SH	10.0YP4/3	S1	2	2	1	2	2	1	1	2	1	2	0.5	8.0	1	1	1
MMG0056	ASYS	130	0	10	23	42	35	SH	10.0YR4/4	S1	2	2	1	3	1	1	2	1	1	1	0.3	2.0	2	1	1
MMG0057	ASYS	210	0	15	24	44	32	SH	10.0YR4/4	S1	2	2	1	3	1	1	2	1	1	1	0.5	2.0	2	1	1
MMG0058	ASIS	150	0	5	42	37	21	SH	10.0YR4/4	S1	2	2	1	2	1	2	46	2	1	2	4.0	30.0	3	1	1
MMG0059	I2																								1
MMG0060	I2																								1
MMG0061	ASYS	90	0	5	40	50	10	SP-SH	10.0YR4/4	S1	2	2	1	3	1	1	2	1	3	1	0.5	3.0	3	1	0
MMG0062	A40S	40	0	0	25	72	3	SP	10.0YR5/4	I2	2	2	1	3	1	1	2	1	1	1	3.0	40.0	2	1	0
MMG0063	ASYS	25	0	0	3	76	21	SH	10.0YR3/4	I2	2	2	1	3	1	1	2	1	2	1	3.0	20.0	4	1	1
MMG0064	I2																								1
MMG0065	ASYS	200	0	7	14	66	20	SH	10.0YR3/4	I2	2	2	1	3	1	1	2	1	2	1	2.1	25.0	4	1	1
MMG0066	A40F	0	0	0	0	0	100	HL	2.5Y 8/2		2	2	2	8	2	1	1	1	1	1	3.0	10.0	1	1	1
MMG0067	S2																								1
MMG0068	A40F	200	0	5	4	20	76	HL	10.0YR5/6	S2	2	2	2	7	1	1	1	2	1	2	3.0	10.0	2	1	1
MMG0069	ASYS	0	0	0	1	84	15	SH	10.0YR4/4	I3	2	1	2	3	1	3	8	2	1	2	0.0	0.0	1	1	0
MMG0070	I3																								1
MMG0071	ASIS	140	0	1	10	80	10	SP-SH	10.0YR4/3	I3	2	1	2	3	1	1	2	1	3	1	0.5	6.0	2	1	0
MMG0072	ASIS	46																							

EXPLANATION: PHYSICAL PROPERTIES

4: GRAIN SHAPE	9: CONSISTENCY	12: DEPTH TO CEMENTED LAYER (CM)	15: CALICHE DEVELOPMENT
7: MOISTURE CONTENT	10: STRUCTURE	13: WEATHERING OF CLASTS	16: 0=OCCASIONAL (1-SX)
8: PLASTICITY OF FINES	11: CEMENTATION-DURATION	14: SOIL PROFILE DEVELOPMENT	(NOTE: #=LAB DATA)

GEOLOGIC STATION DATA
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMOTABLE
II-1-2

FUGRO NATIONAL, INC.

24 MAR 81

FN-TR-27-WA-II

Station No.

1	2	3	4	5	6	7	8	9	10

 Described Geol. Unit

1	2	3	4	5	6	7	8	9	10

Date _____ Complete Geol. Unit _____

Observers _____ Field Photo Nos. _____

Air Photo No. _____ Sample (No=0, Yes=1)

1	2	3	4	5	6	7	8	9	10

SOIL PROPERTIES

1. Grain-Size Distribution: MPS (mm) - grain size of coarsest fraction; boulders and cobbles - percent of total; gravel, sand, and fines - percent less than 3 inches.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
2. USCS Symbol

1	2	3	4	5	6	7	8	9	10
3. Descriptive Name (one adjective only) _____
4. Munsell Color (not applicable to gravel)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
5. Lithology of gravel, cobbles, boulders: give rock type (I, IZ, M, etc.) in order of abundance.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
6. Grain Shape (coarse grained soil only): 1) Angular, 2) Subangular, 3) Subrounded, 4) Rounded, 5) Well-rounded.

1	2	3	4	5	6	7	8	9	10
7. Moisture Content: 1) Dry, 2) Slightly moist, 3) Moist, 4) Very moist, 5) Wet

1	2	3	4	5	6	7	8	9	10
8. Plasticity of Fines: 1) None, 2) Low, 3) Medium, 4) High

1	2	3	4	5	6	7	8	9	10
9. Consistency:
Coarse-grained: 1) Very Loose, 2) Loose, 3) Medium Dense, 4) Dense, 5) Very Dense
Fine-grained: 6) Soft, 7) Firm, 8) Stiff, 9) Hard

1	2	3	4	5	6	7	8	9	10
10. Structure: 1) Non-stratified (homogeneous), 2) Stratified-tabular, 3) Stratified-other; if 3) describe _____

1	2	3	4	5	6	7	8	9	10
11. Cementation-Induration: 1) None, 2) Weak, 3) Moderate, 4) Strong

1	2	3	4	5	6	7	8	9	10
12. Depth to Cemented Layer (cm)

1	2	3	4	5	6	7	8	9	10
13. Weathering of boulders, cobbles, and gravel:
1) Fresh, 2) Slight, 3) Moderate, 4) Very

1	2	3	4	5	6	7	8	9	10
14. Degree of Soil Profile Development: 1) None (A-C profile), 2) Poor (incipient B-horizon), 3) Well (prominant B-horizon)
Describe _____

1	2	3	4	5	6	7	8	9	10
15. Degree of Caliche Development: 1) None, 2) Stage I, 3) Stage II, 4) Stage III, 5) Stage IV
Describe _____

1	2	3	4	5	6	7	8	9	10

FIELD DATA SHEET
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-1-1
1 OF 2

FURRO NATIONAL, INC.

24 MAR 81

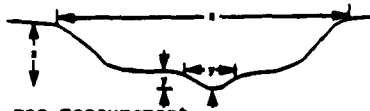
FN-TR-27-WA-II

TERRAIN

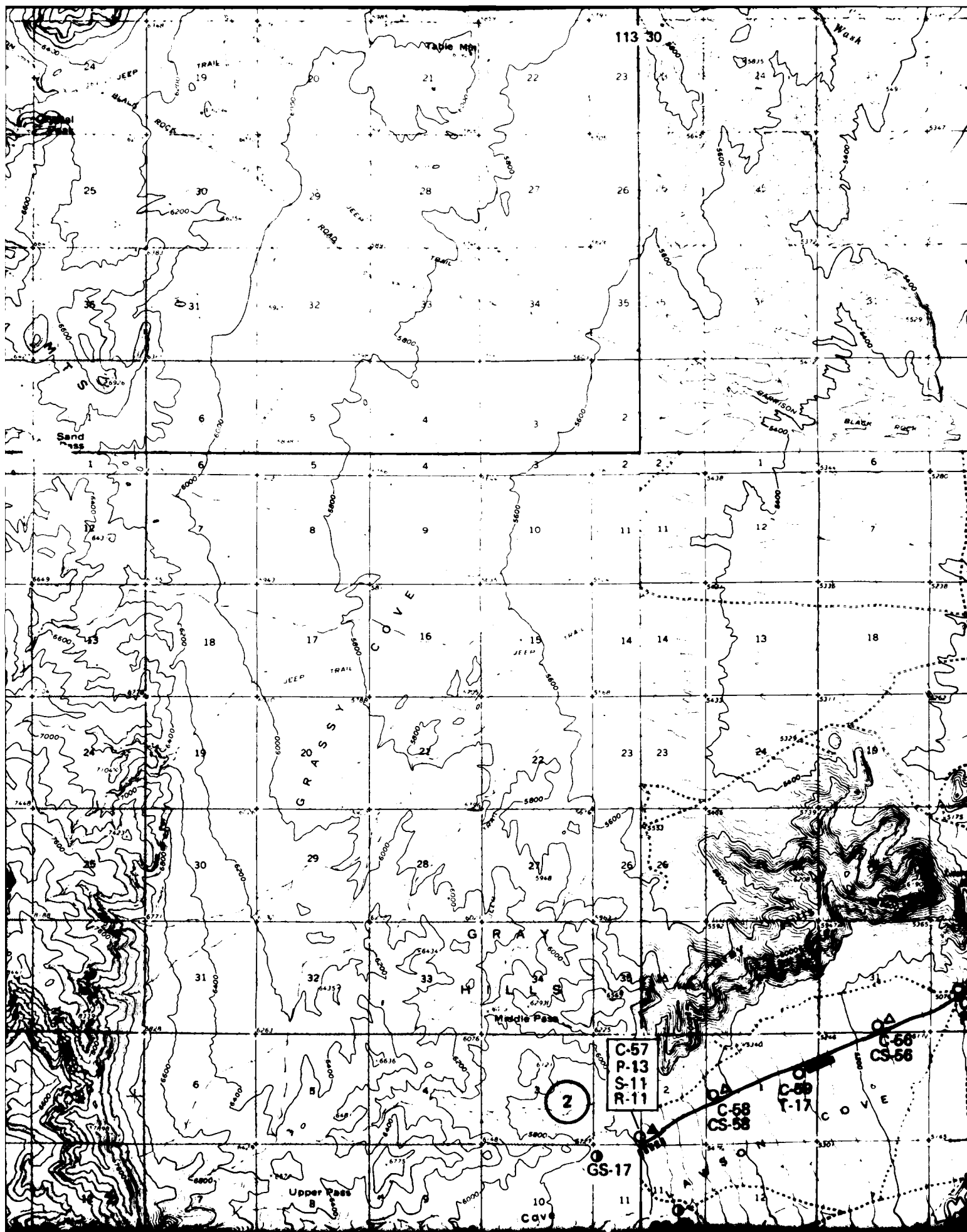
16. Average Drainage Depth (ft)

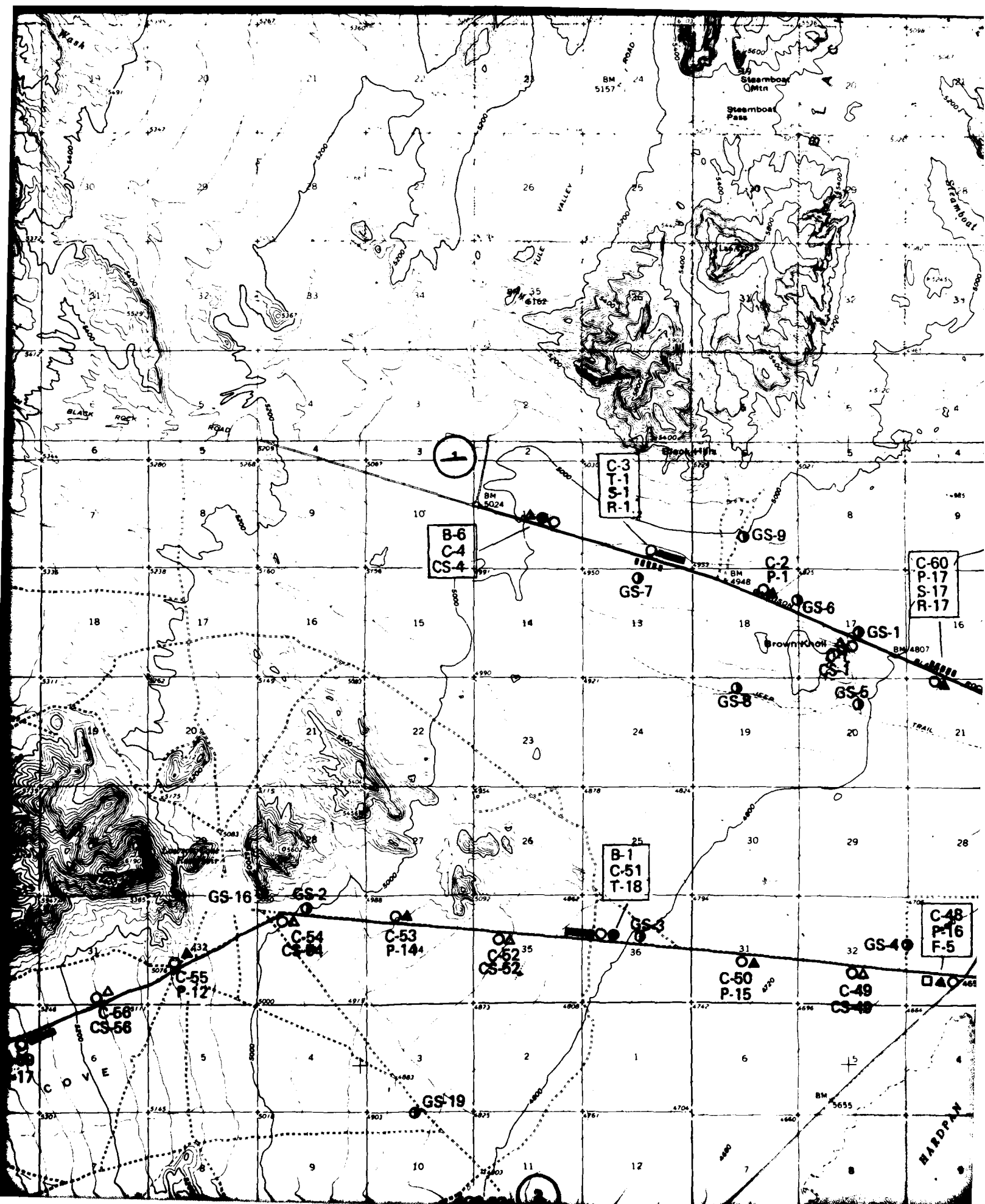
17. Average Drainage Width (ft)

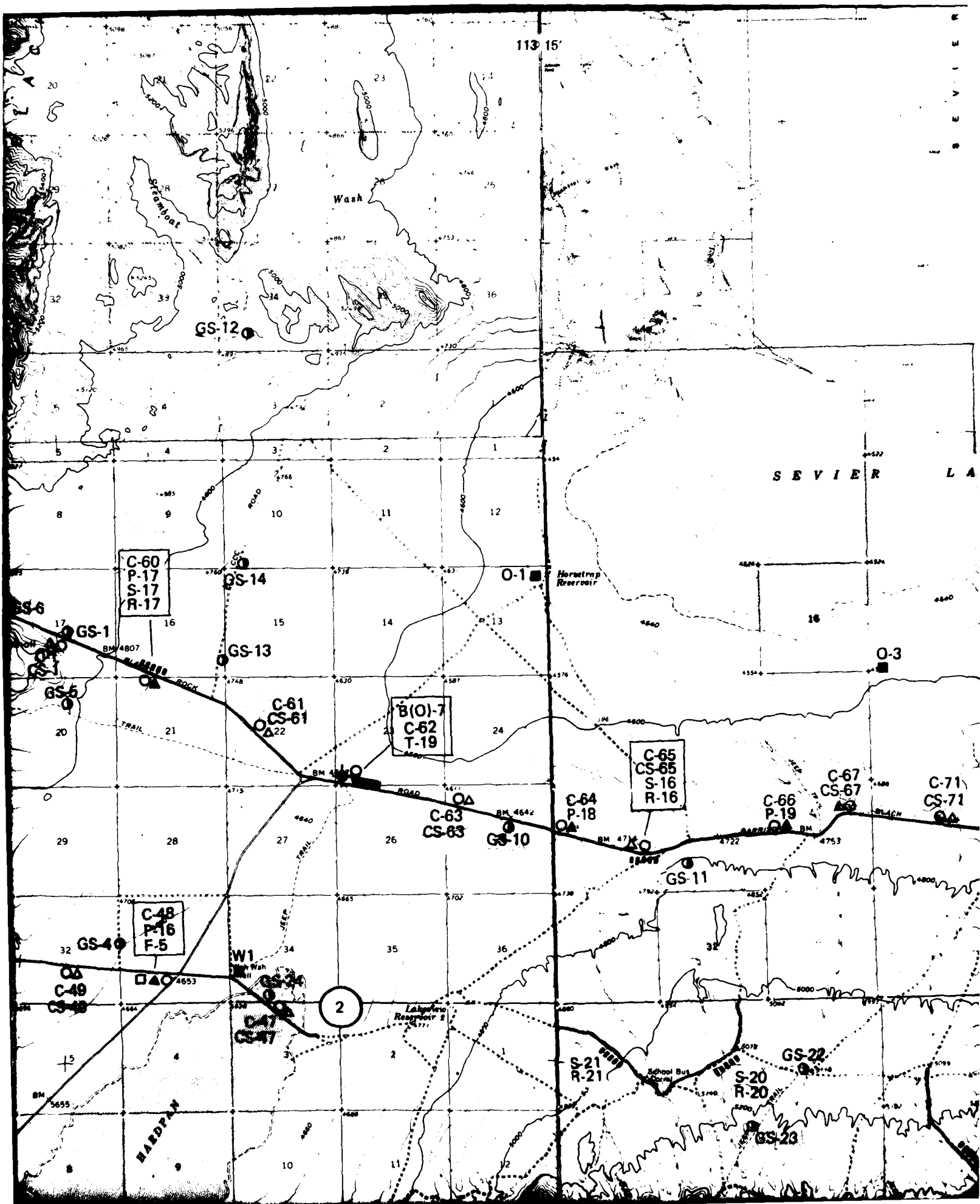
18. Slope (percent) - field and/or topo map measurement

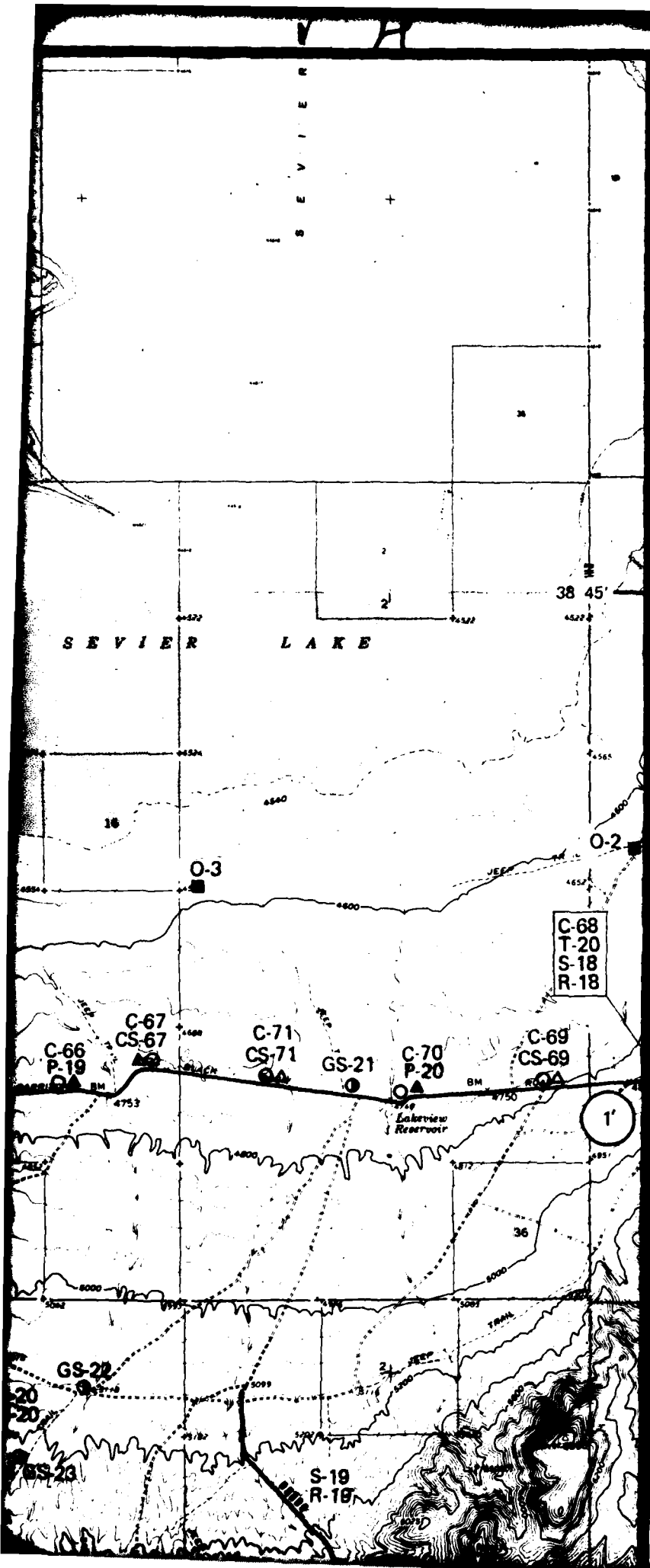


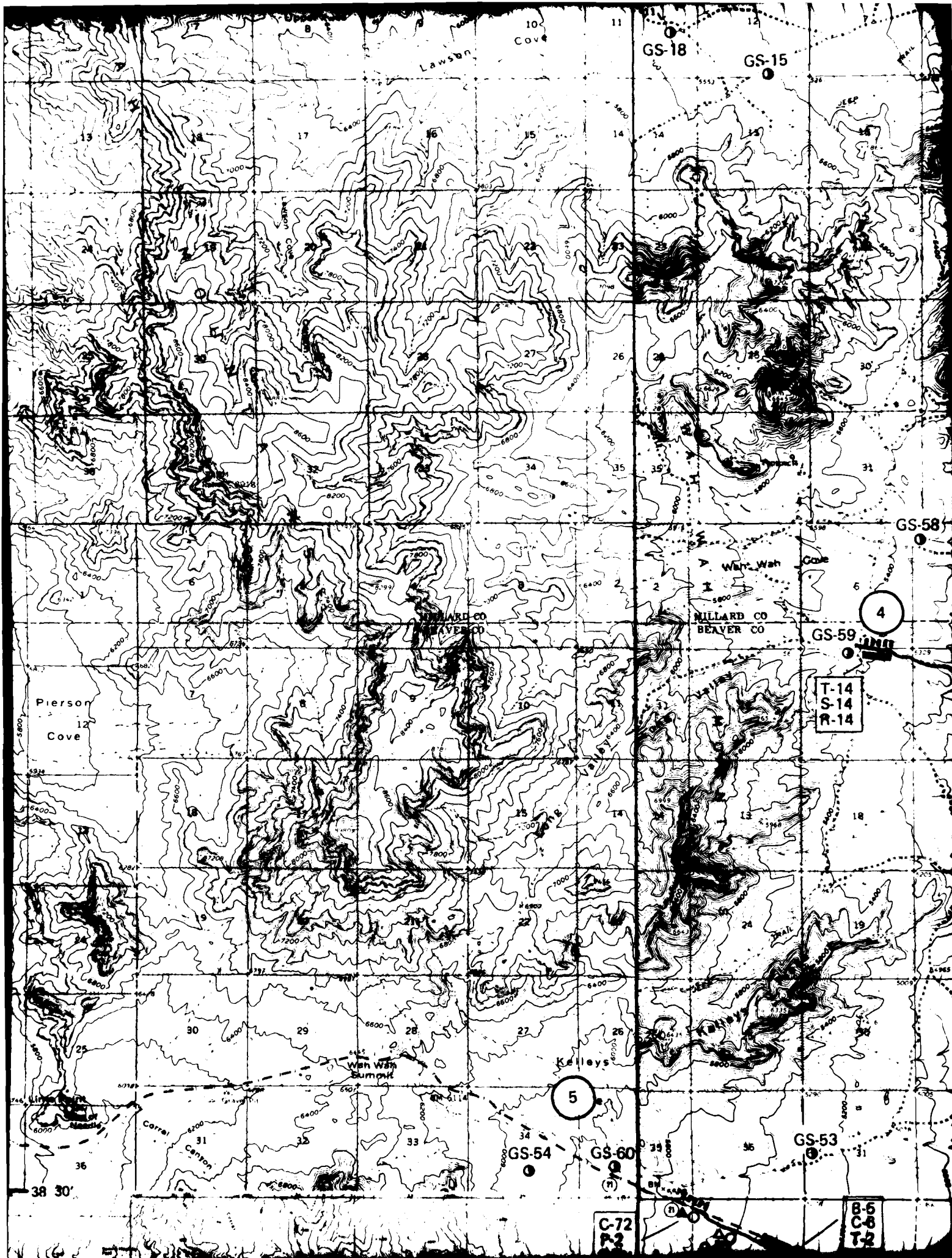
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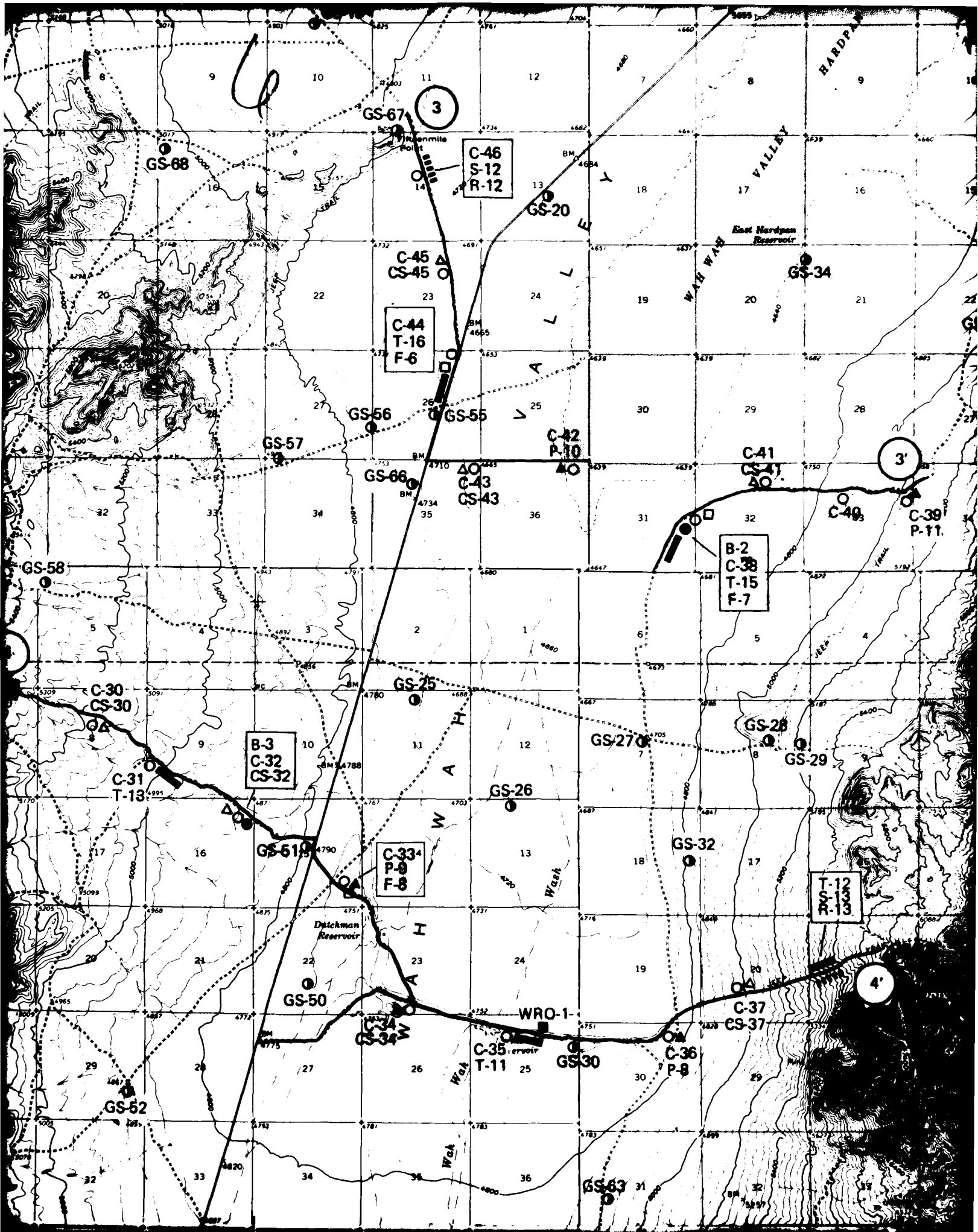


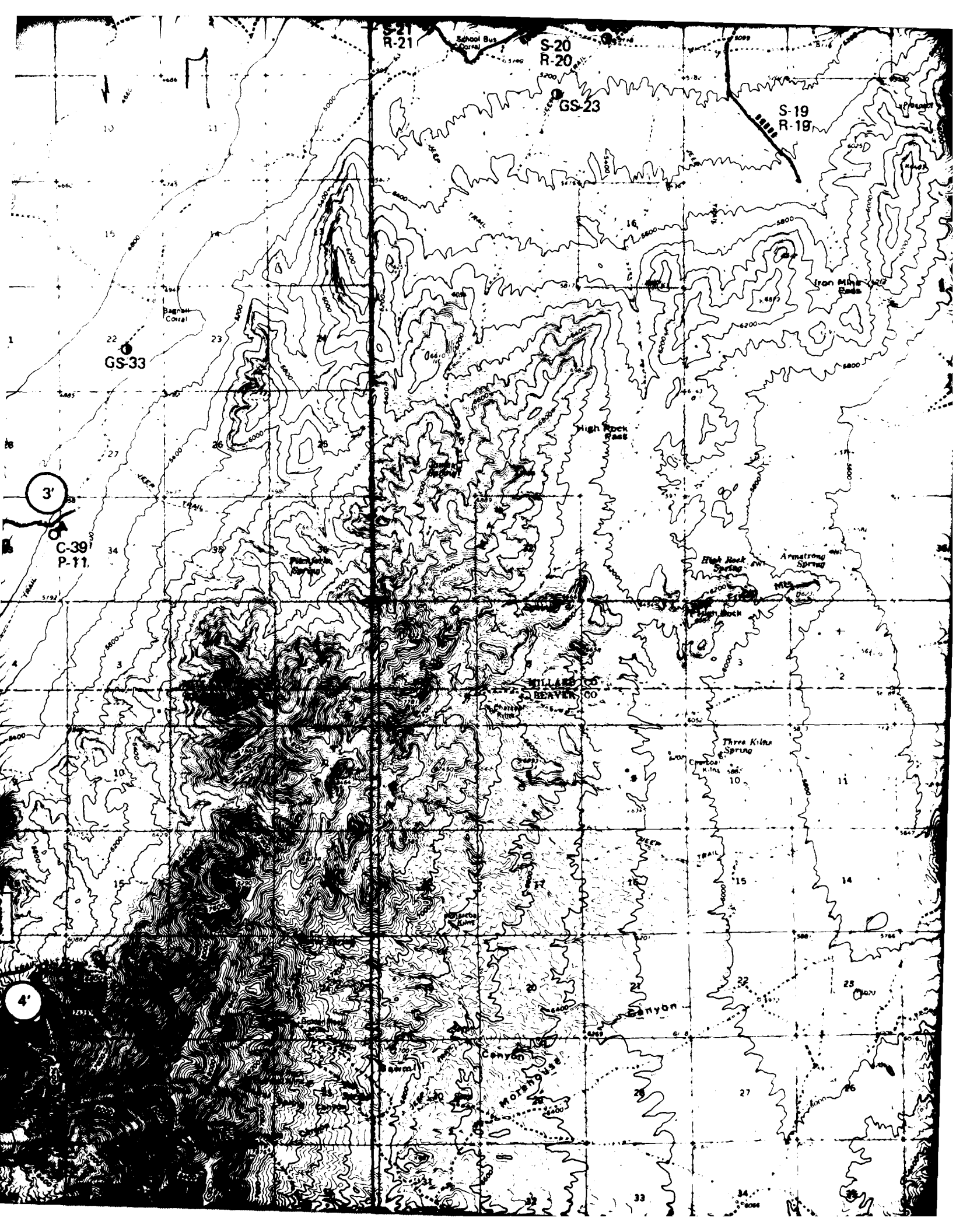






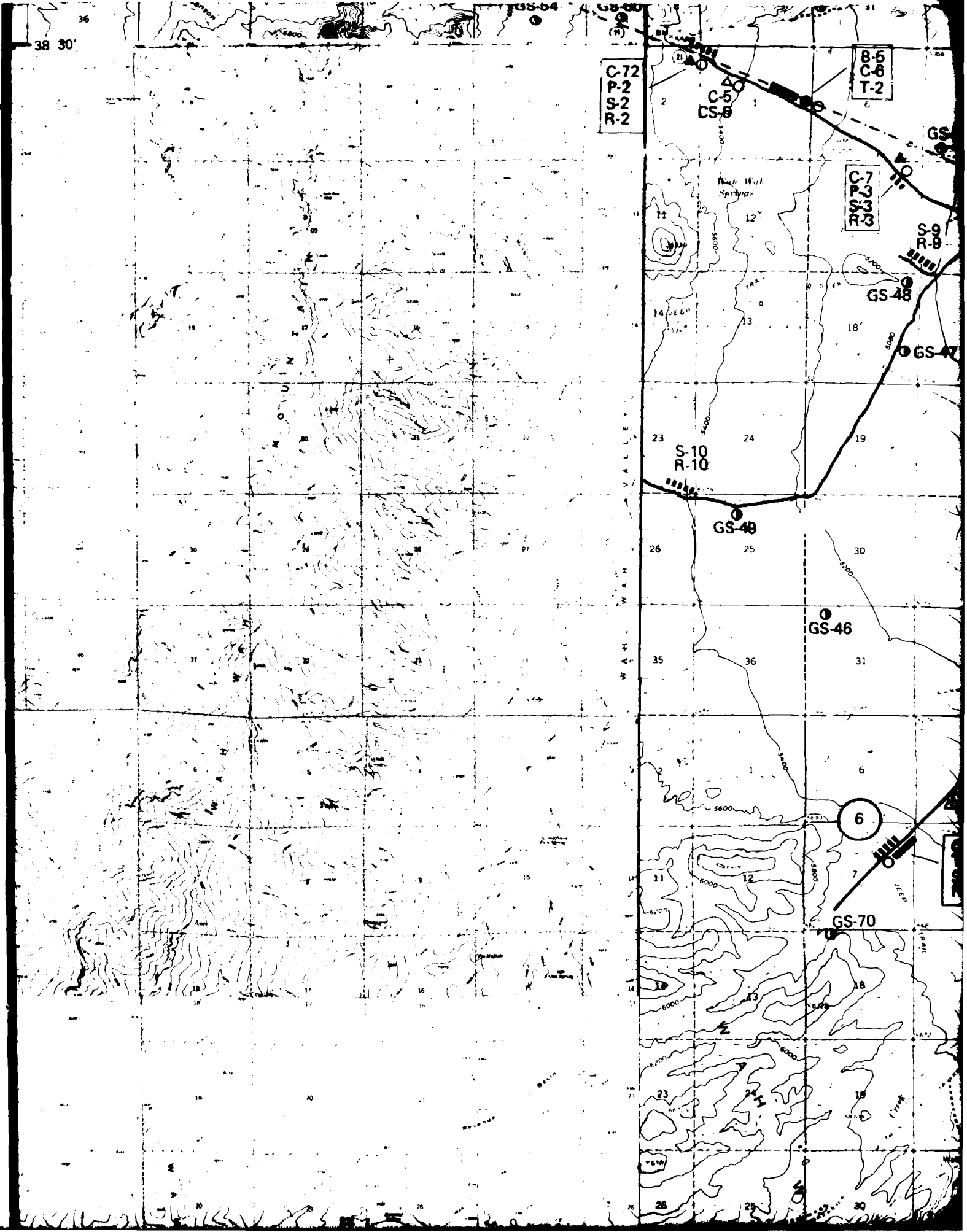


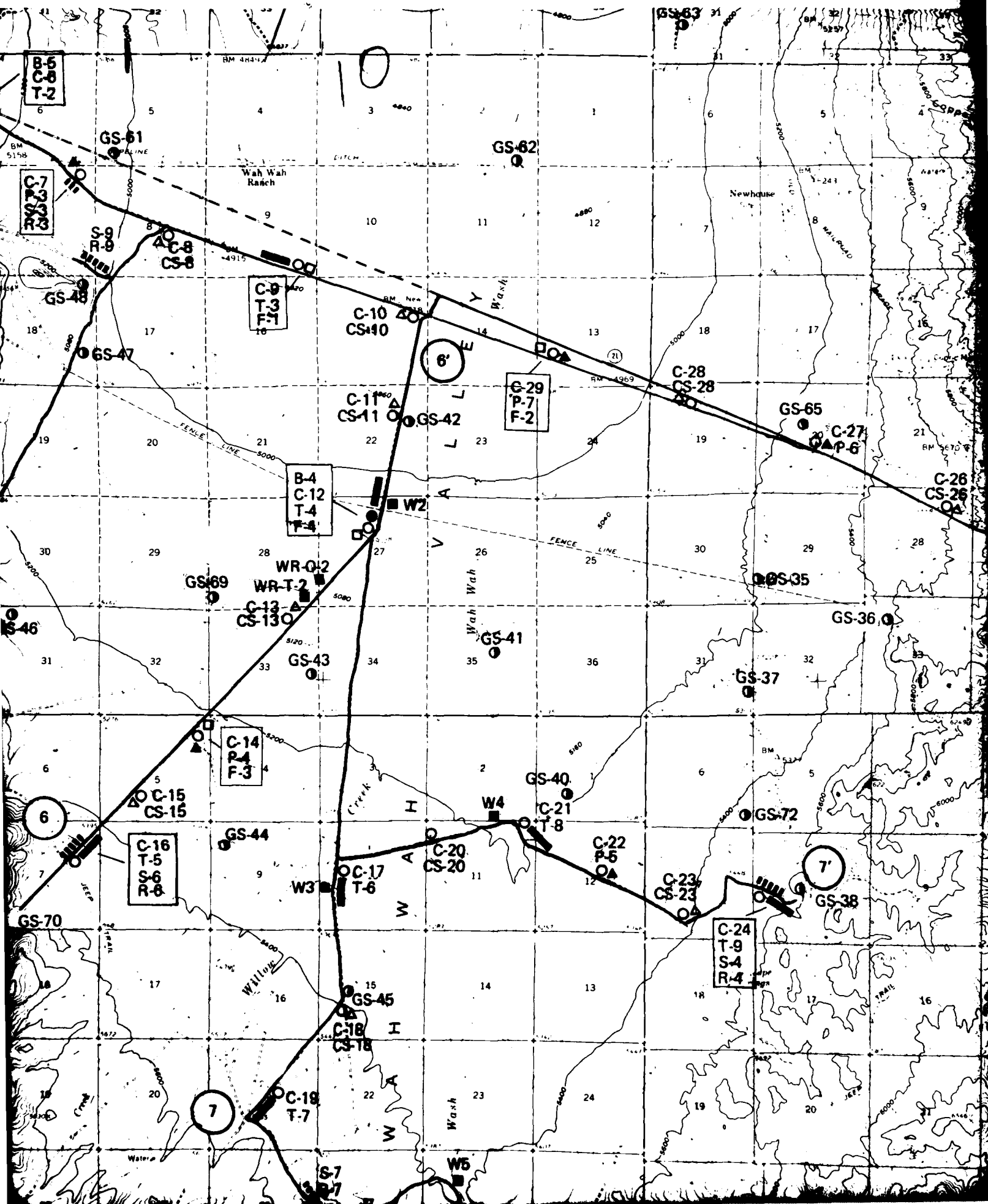


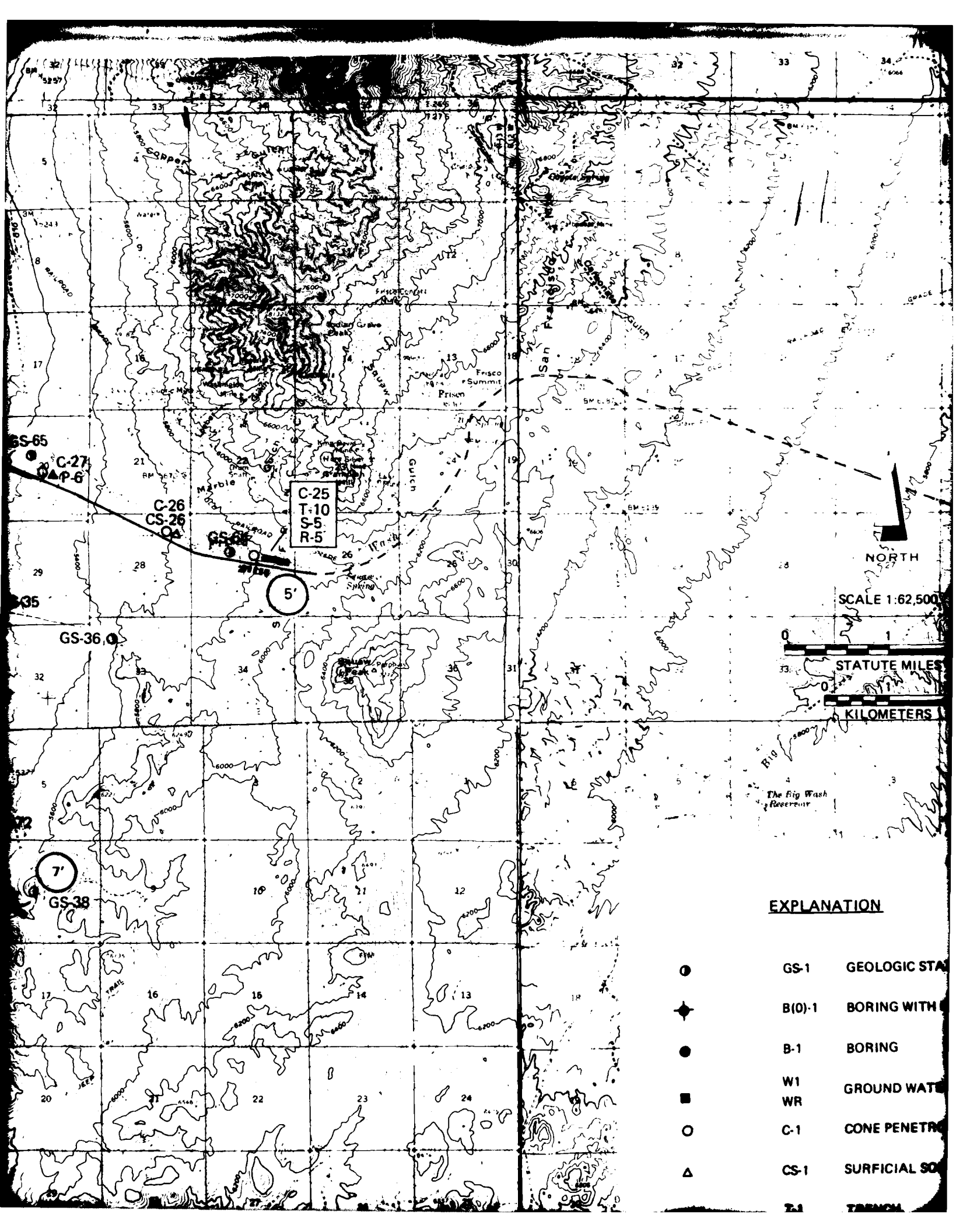


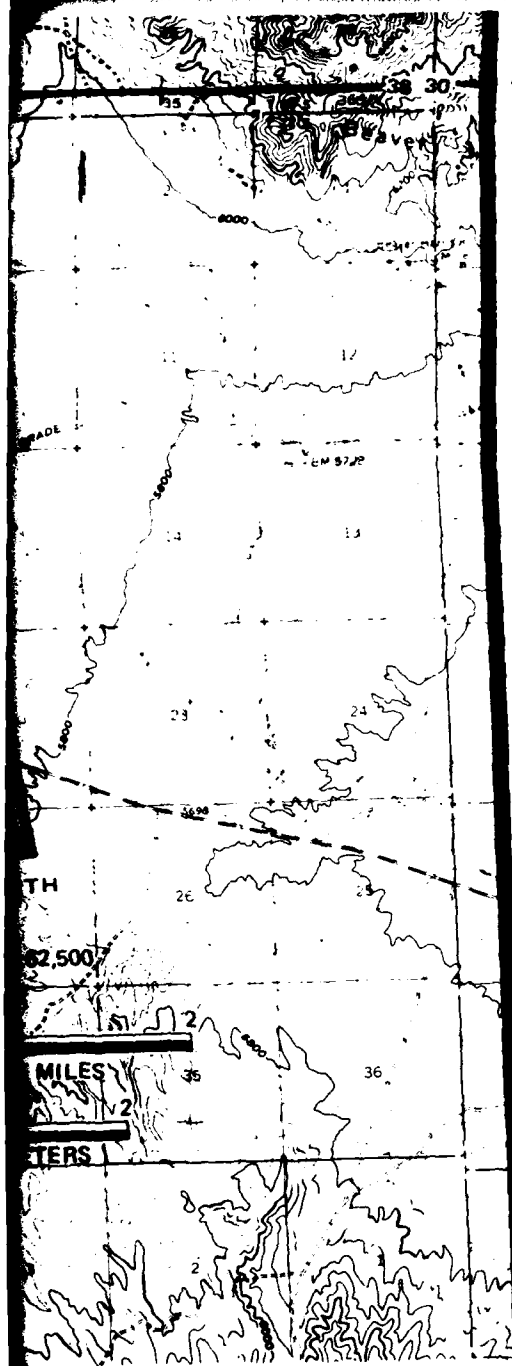
8

1









12

LOGIC STATION

LOG WITH OBSERVATION WELL

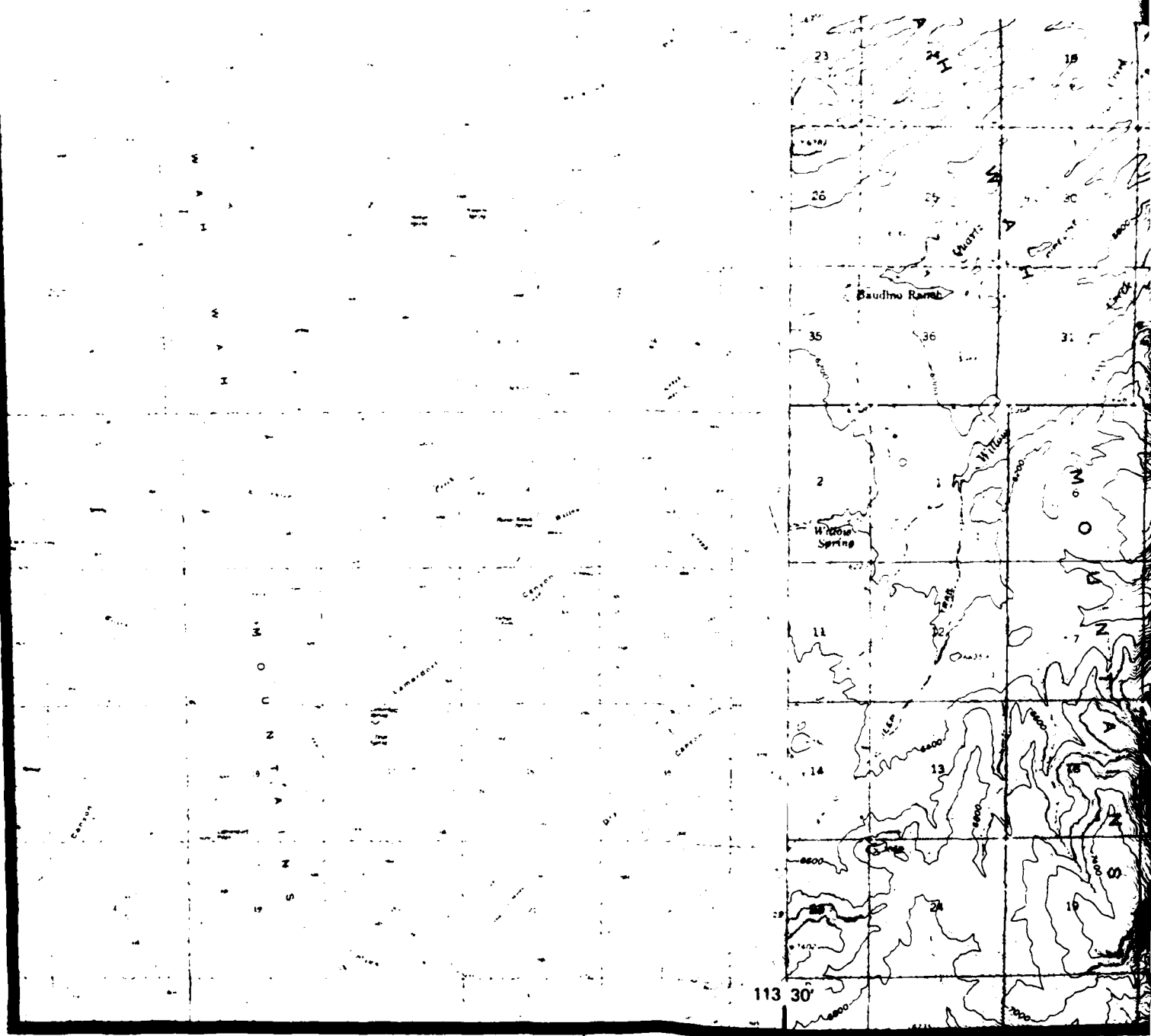
LOG

NO WATER LEVEL MEASUREMENT WELL

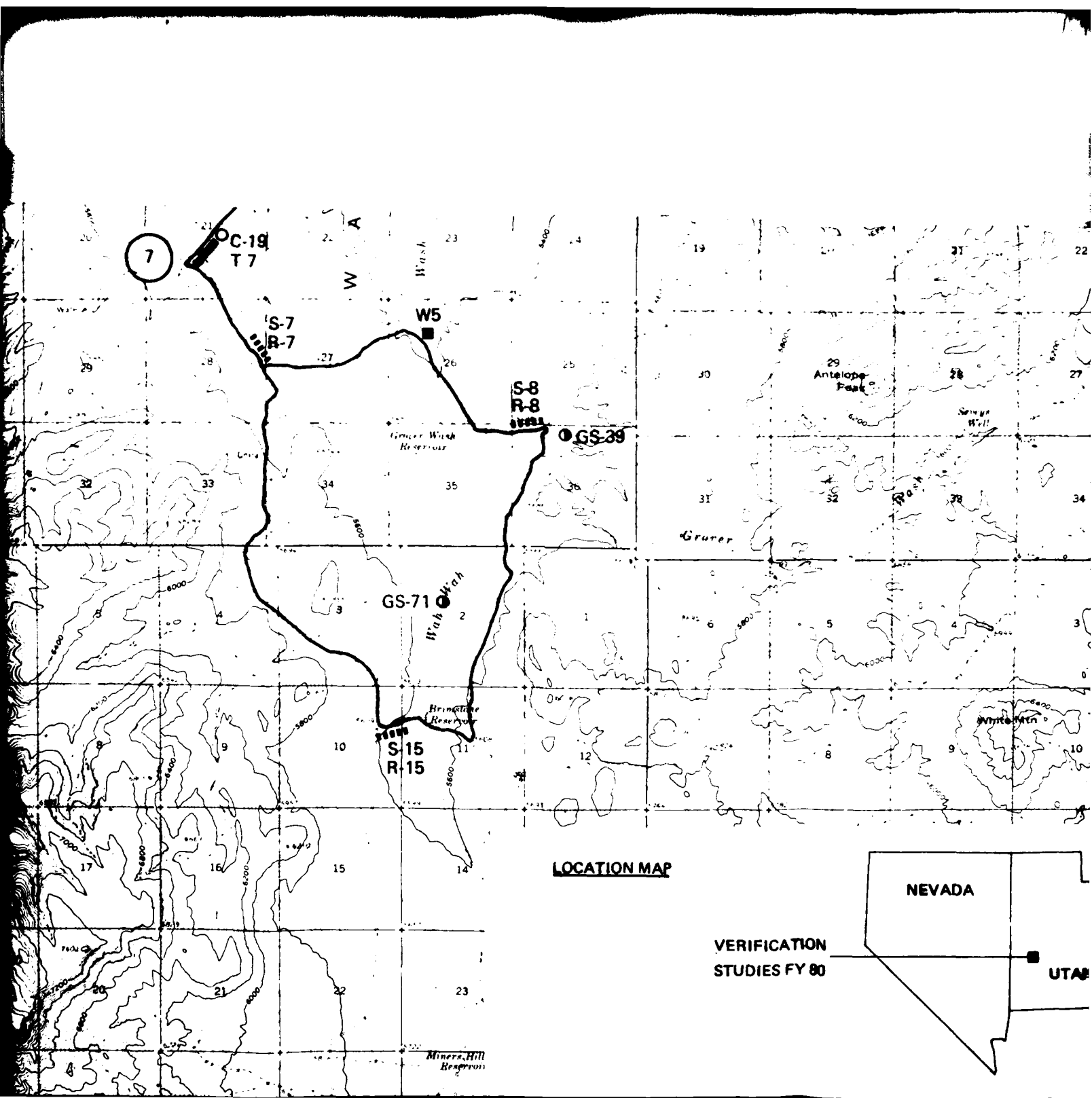
PENETROMETER TEST

SPECIAL SOIL SAMPLE

13

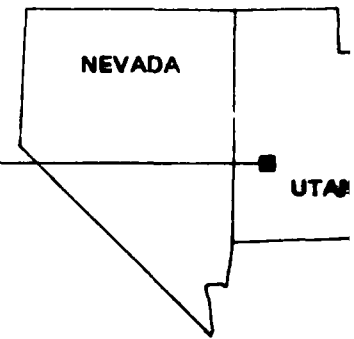


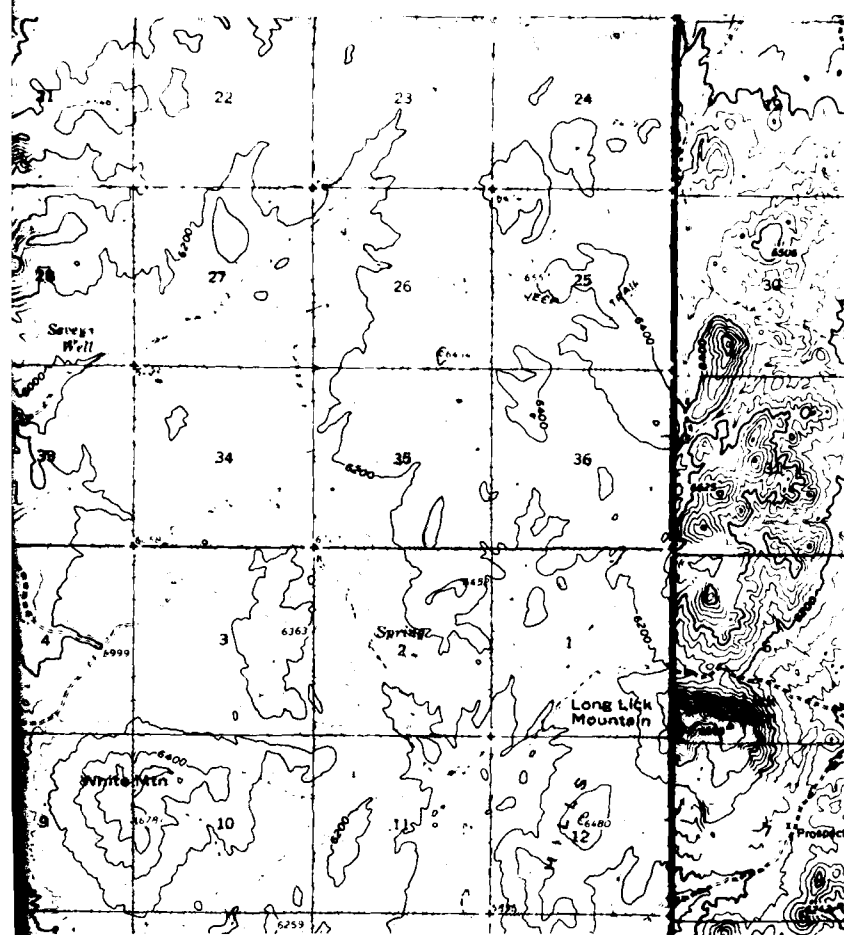
24 MAR 81



LOCATION MAP

**VERIFICATION
STUDIES FY 80**



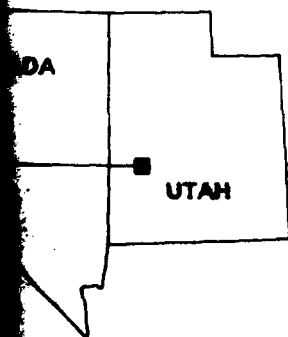


●	B-1	BORING
■	W1 WR	GROUND WATER LEVEL MEASUREMENT
○	C-1	CONE PENETROMETER TEST
△	CS-1	SURFICIAL SOIL SAMPLE
—	T-1	TRENCH
▲	P-1	TEST PIT
	S-1	SEISMIC REFRACTION LINE
	R-1	ELECTRICAL RESISTIVITY LINE



ACTIVITY LINE

NOTE: Due to the exaggeration of the map symbols, the exact location of any combination of activities is where either the boring (1st) or the CPT (2nd) is situated. Single activities are most securely located nearest the center of the symbol.



ACTIVITY LOCATION MAP WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FUGRO NATIONAL, INC.

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BORING

GROUND WATER LEVEL MEASUREMENT WELL

CONE PENETROMETER TEST

SURFICIAL SOIL SAMPLE

TRENCH

TEST PIT

SEISMIC REFRACTION LINE

ELECTRICAL RESISTIVITY LINE

ACTIVITY LINE

of the map symbols, the exact location of any
is where either the boring (1st) or the CPT (2nd)
are most securely located nearest the center of

**TY LOCATION MAP
AH VALLEY, UTAH**

INVESTIGATION

THE AIR FORCE - BMO

DRAWING

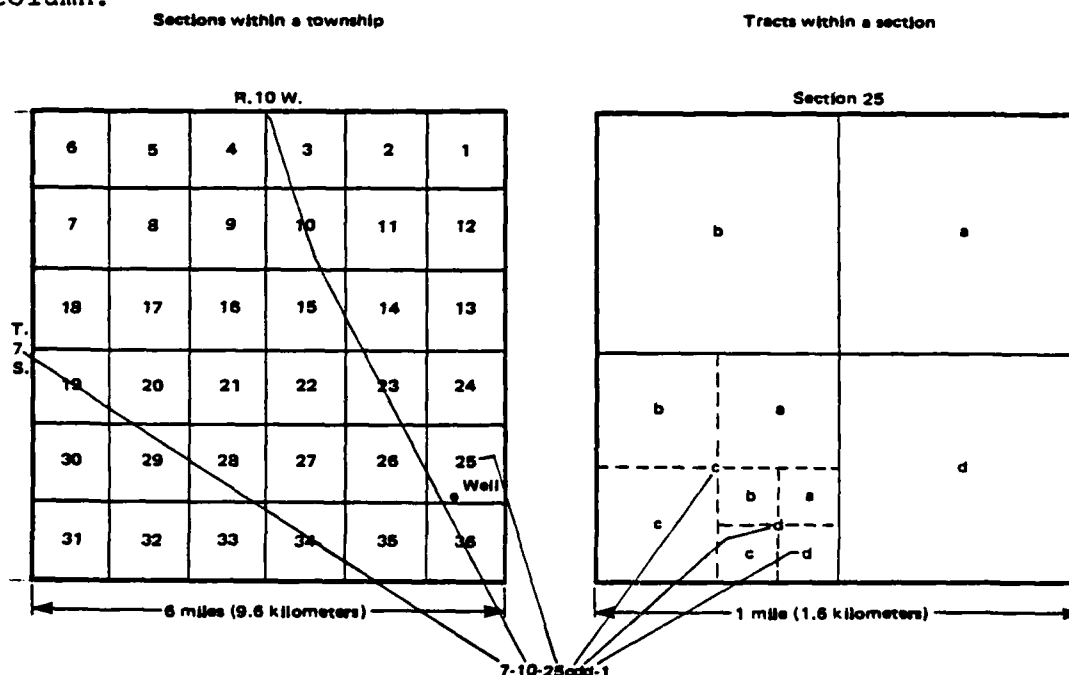
II-1-1

NATIONAL, INC.

2.0 GROUND-WATER DATA

Explanation:

Existing ground-water data in Wah Wah Valley were collected from all available sources. These data were updated where possible from measurements taken during Fugro field operations, and all data are shown in Table II-2-1. Locations of water wells in which water-level measurements were available are shown in Drawing II-1-1. Well numbers listed in the left hand column of Table II-2-1 refer to well locations shown on Drawing II-1-1. Actual well numbers giving location, according to the Bureau of Land Management Land Survey System, are shown in the second column.



Water levels generally refer to the static ground-water table in the unconfined basin-fill aquifer. Perched conditions or levels in artesian aquifers are noted where known.

FN-TR-27-WA-II

WELL NO.	WELL LOCATION NUMBER* (Twp-Rge-Sec)	ELEVATION OF GROUND SURFACE FEET (METERS) ABOVE M.S.L.	DEPTH OF WELL FEET (METERS)	WATER LEVEL			REFERENCES**/REMARKS
				DEPTH BELOW GROUND SURFACE- FEET (METERS)	DATE MEASURED	ELEVATION - FEET (METERS) ABOVE M.S.L.	
W-1	24-13-34ccb	4845 (1416)	294 (90)	212 (65)	1972	4433 (1351)	1, 5
W-2	27-14-27aba	5020 (1530)	500 (152)	dry	9-51	< 4520 (1378)	1, 2
W-3	28-14-10cca	5334 (1626)	1117 (450)	800 (244)	6-75	4534 (1382)	2
W-4	28-14-11abb	5190 (1582)	1475 (450)	670 (204)	3-74	4520 (1378)	1, 2
W-5	28-14-26bd	5390 (1643)	757 (231)	535 (163)	5-74	4855 (1480)	2
O-1	24-13-13aa	4550 (1387)	150 (46)	94 (29)	7-80	4456 (1358)	3
O-2	24-11-18ca	4840 (1414)	150 (46)	139 (42)	11-80	4501 (1372)	3
O-3	24-12-15cc	4580 (1396)	150 (46)	145 (44)	11-80	4435 (1352)	3
B(O)-7	24-13-23cc	4620 (1408)	201 (61)	178 (54)	10-80	4442 (1354)	3
WRO-1	28-14-25ab	4780 (1451)	1135 (345)	dry	1-81	< 3625 (1105)	4
WRT-2	27-14-28dd1	5080 (1548)	1350 (412)	no data available	—	—	4
WRO-2	27-14-28dd2	5080 (1548)	1399 (426)	no data available	—	—	4

* SALT LAKE BASELINE AND MERIDIAN; ALL TOWNSHIPS ARE SOUTH, ALL RANGES ARE WEST

** 1. STEPHENS, J.C., 1974, HYDROLOGIC RECONNAISSANCE OF WAH WAH VALLEY, TECHNICAL PUBLICATION NO. 47, STATE OF UTAH, DEPT. OF NATURAL RESOURCES

2. UTAH STATE ENGINEERS OFFICE, DRILL LOGS

3. FNI VERIFICATION STUDIES, FY 80

4. FNI WATER RESOURCES INTERMEDIATE AQUIFER DRILLING PROGRAM

5. USGS COMPUTER PRINT-OUT OF UTAH WATER WELLS, 1974

GROUND-WATER DATA
WAH WAH VALLEY, UTAHMX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMOTABLE
II-2-1

FUGRO NATIONAL, INC.

24 MAR 81

3.0 SEISMIC REFRACTION DATA

Explanation: Each figure shows seismic wave travel times plotted versus surface distance between the energy source (shot) and the detector (geophone) for a single seismic line. Distances are measured along the line from geophone number 1 which is designated as zero distance. Distances to the right (on the paper) of geophone 1 are positive. The direction arrow gives the approximate direction along the geophone array from geophone 1 to geophone 24.

Travel Time Versus Distance Graph (Upper Half of Figure)

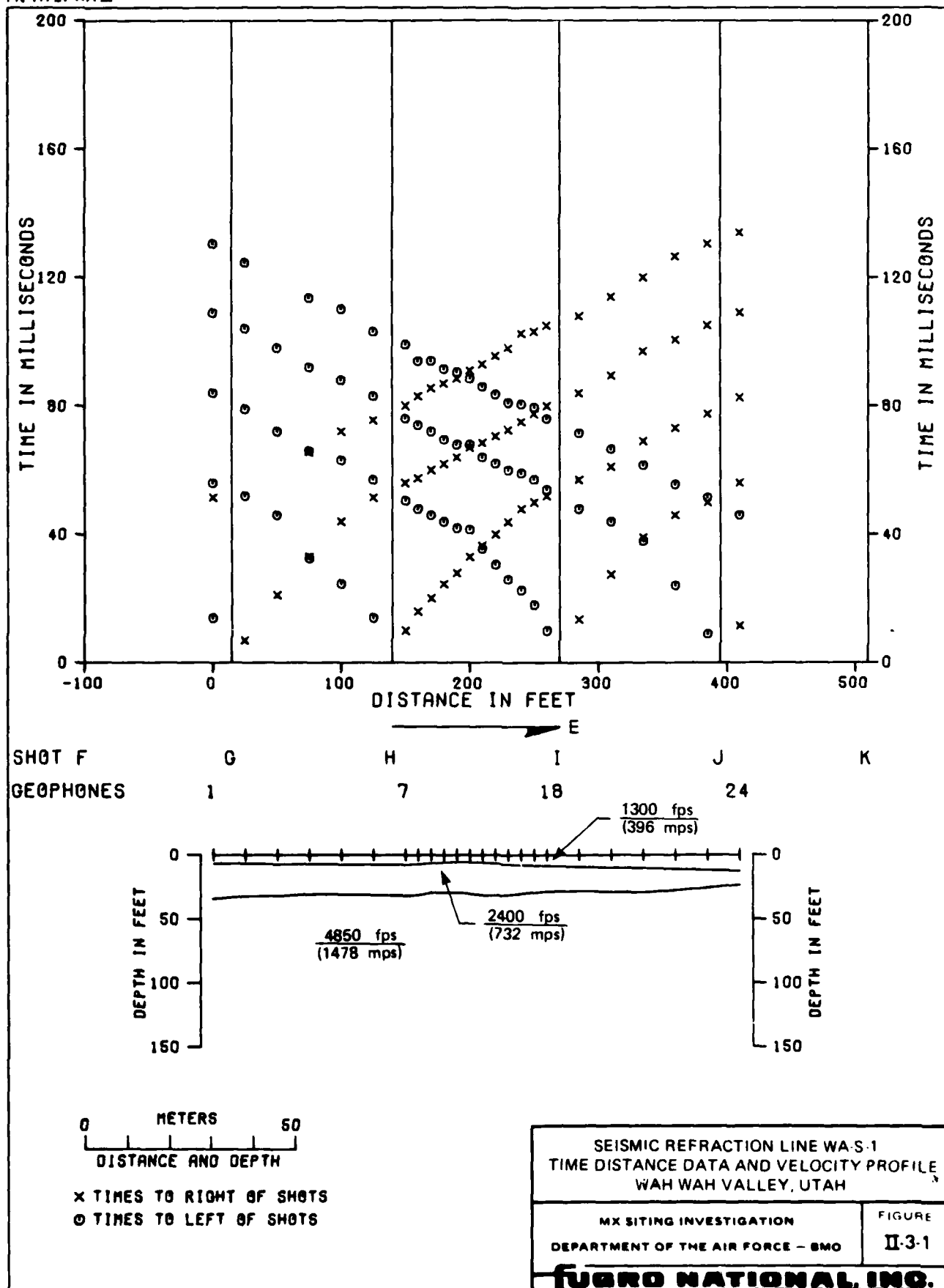
This is a travel time versus distance graph. The abscissa represents distance; the ordinate, time. The six vertical lines represent the locations of shots (designated as F, G, H, I, J, and K). The symbol, X, denotes travel times at geophones that were located to the right of a shot. The symbol, @, denotes travel times that were located to the left of shots.

Velocity Cross Section (Lower Half of Figure)

This is an interpreted velocity cross section beneath the seismic line. The top line represents the ground-surface profile. The short vertical lines crossing the top line mark the geophone positions. The depth scale is plotted relative to a point on the line which was arbitrarily chosen as "zero elevation" at the time the line was surveyed. The additional lines across the cross section represent the interpreted boundaries between layers of material with different compressional wave

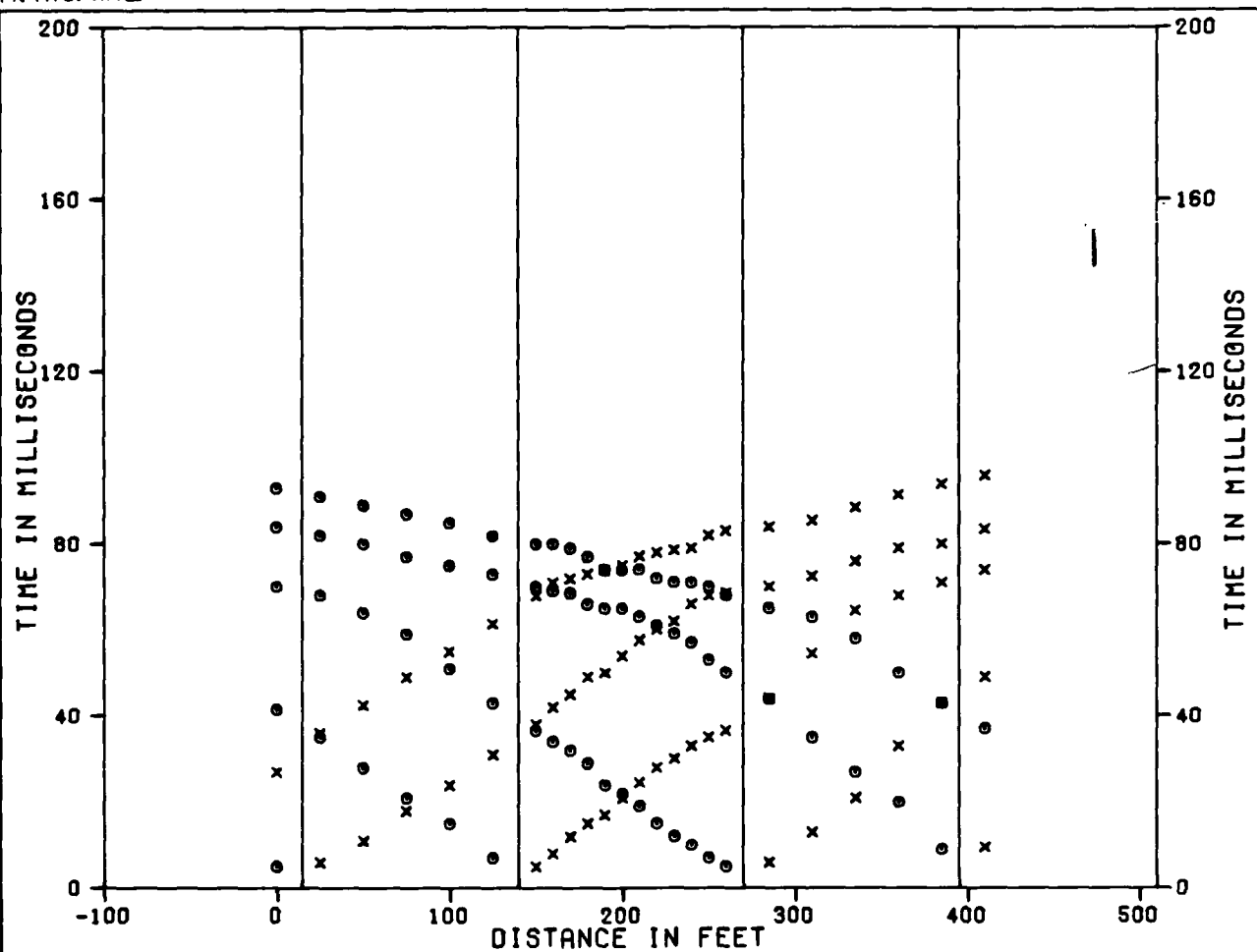
velocities. These boundaries are commonly called "refractors". The velocity interpreted to be representative of each layer is shown.

FN-TR-27-WA-II



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FN-TR-27-WA-II



SHOT F
GEOPHONES

G

H

ESE

I

J

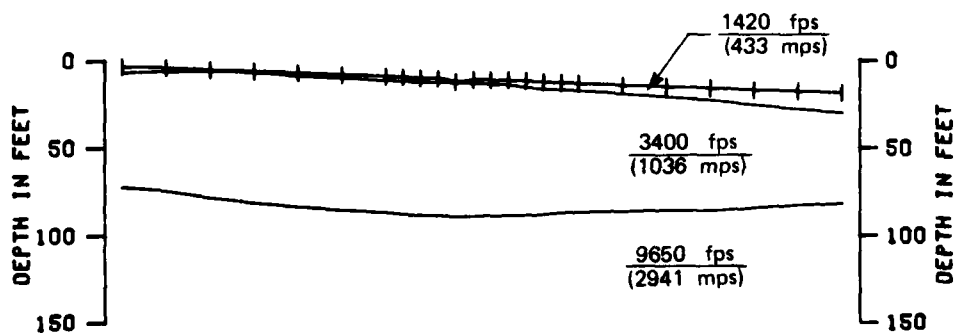
K

1

7

18

24



0 METERS 50
DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE WA-S-2
TIME DISTANCE DATA AND VELOCITY PROFILE
WAH WAH VALLEY, UTAH

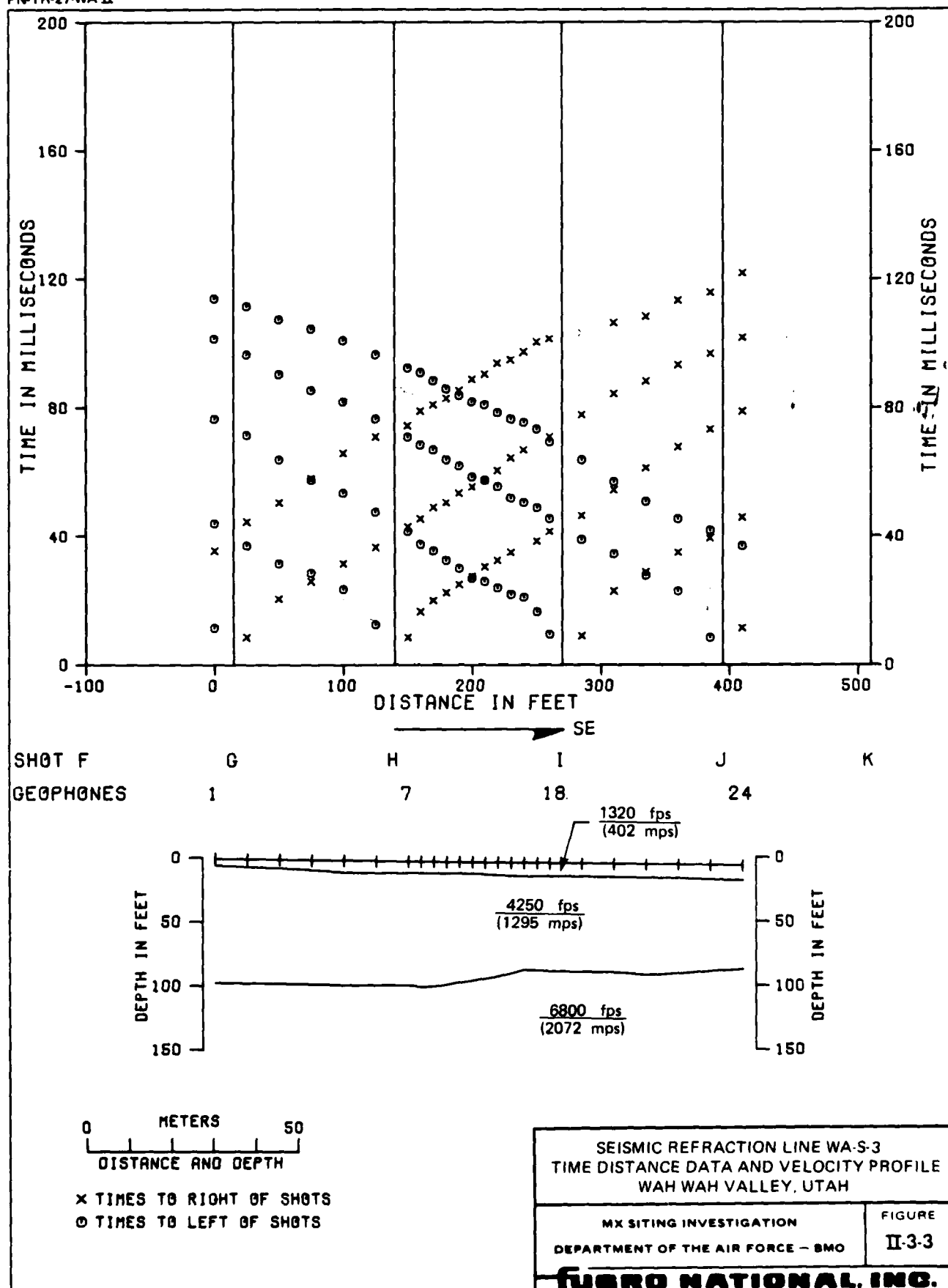
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-3-2

FUSRO NATIONAL, INC.

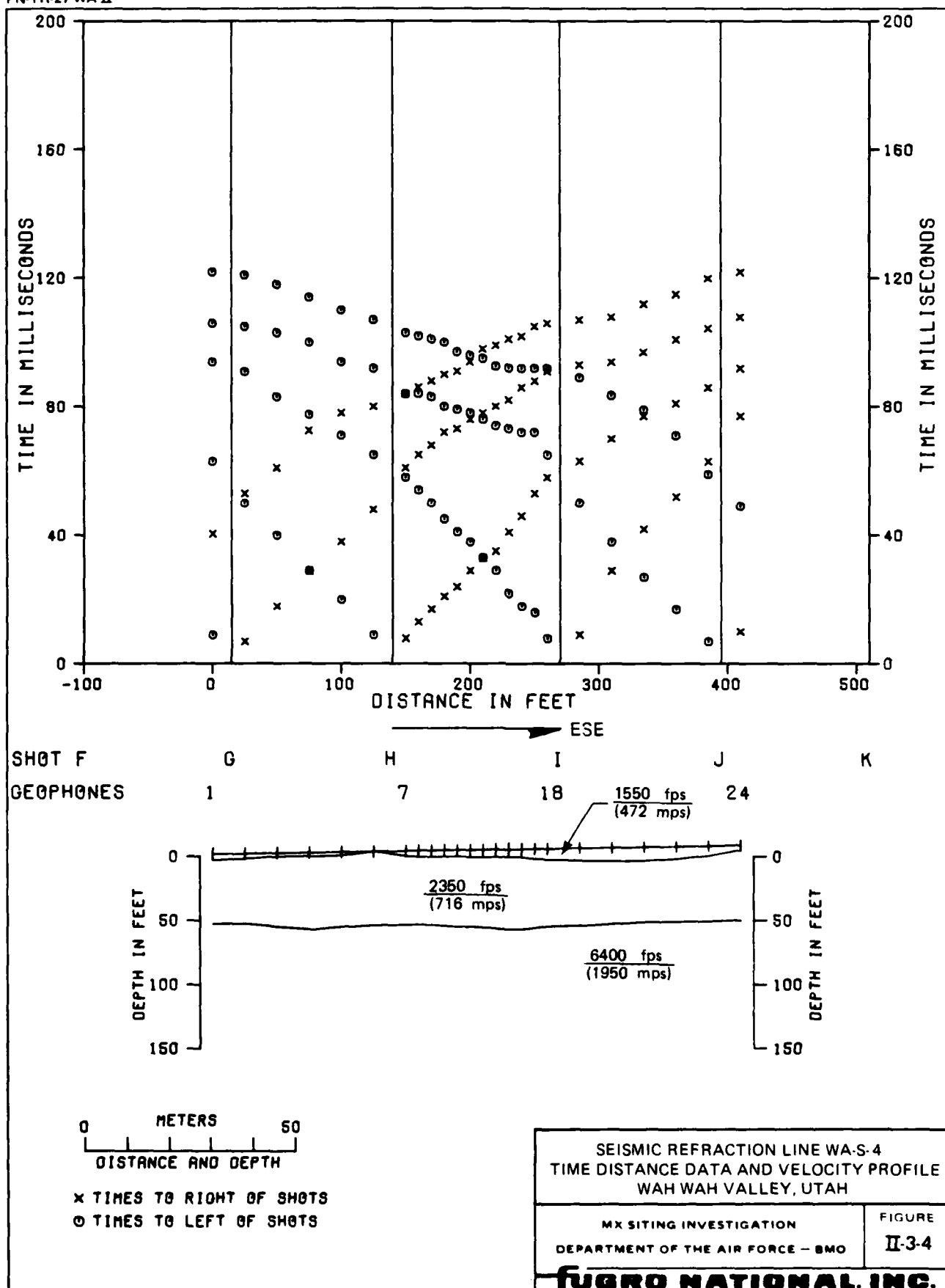
24 MAR 81

FN-TR-27-WA-II

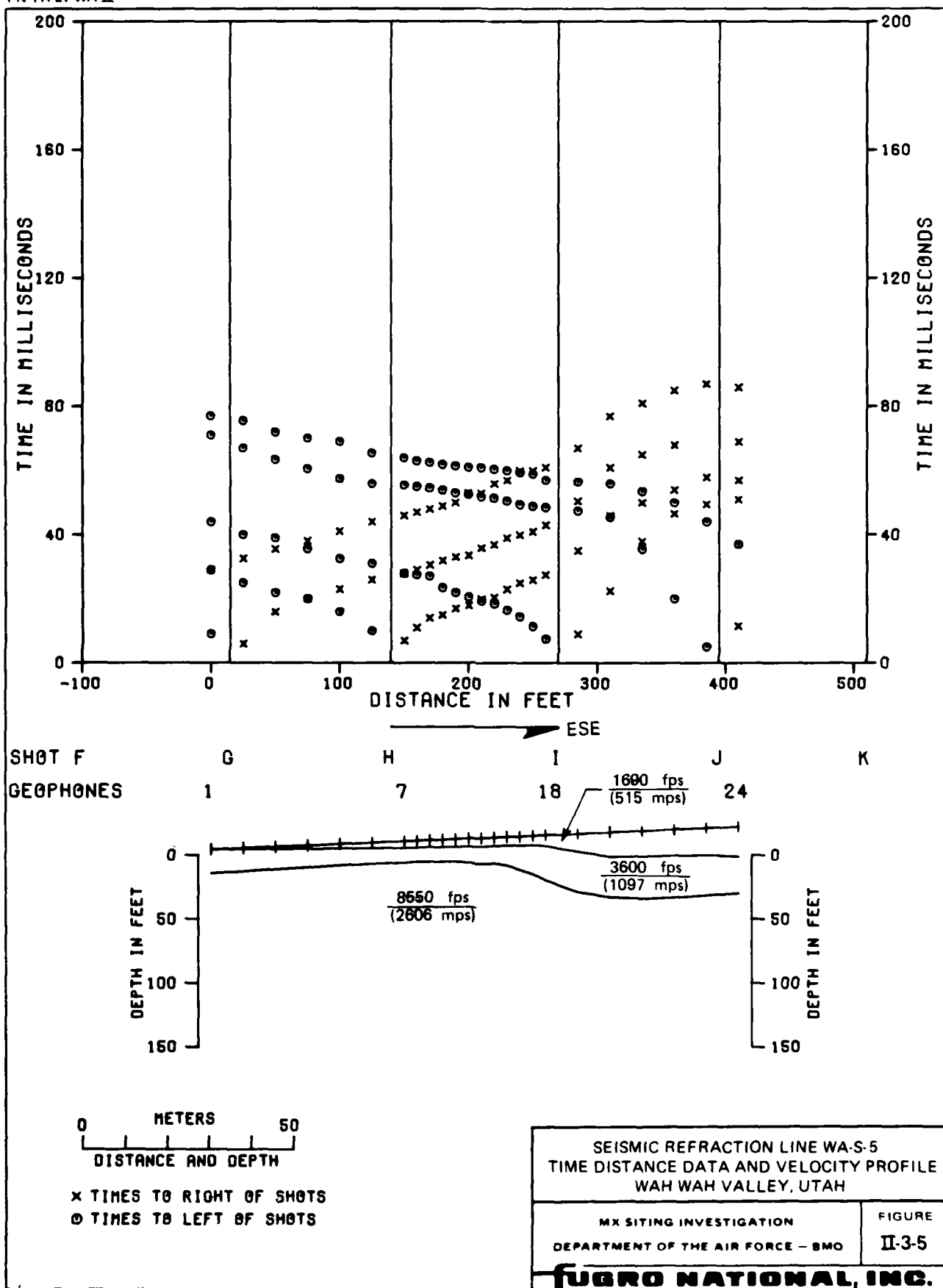


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FN-TR-27-WA-II



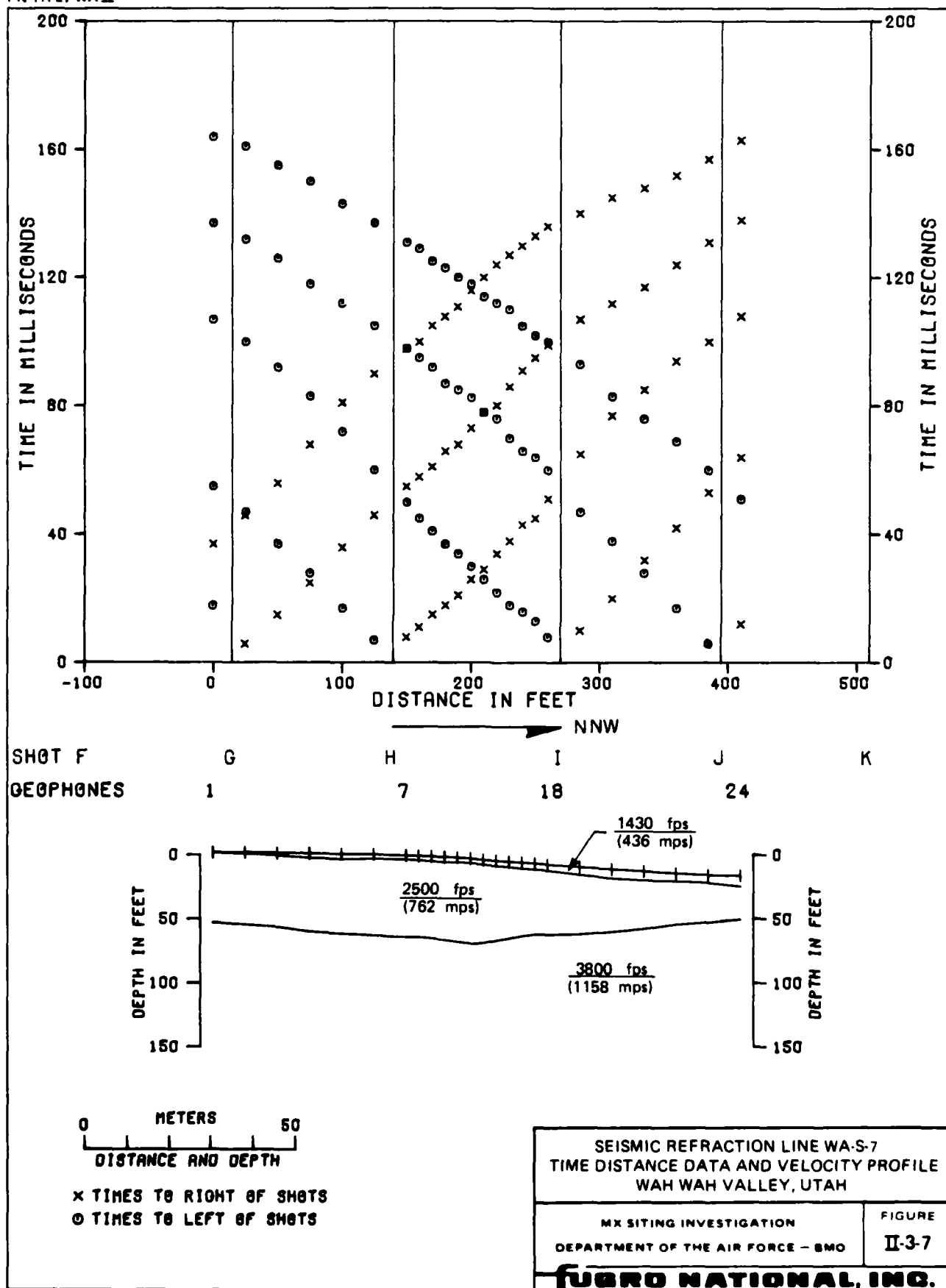
FN-TR-27-WA-II



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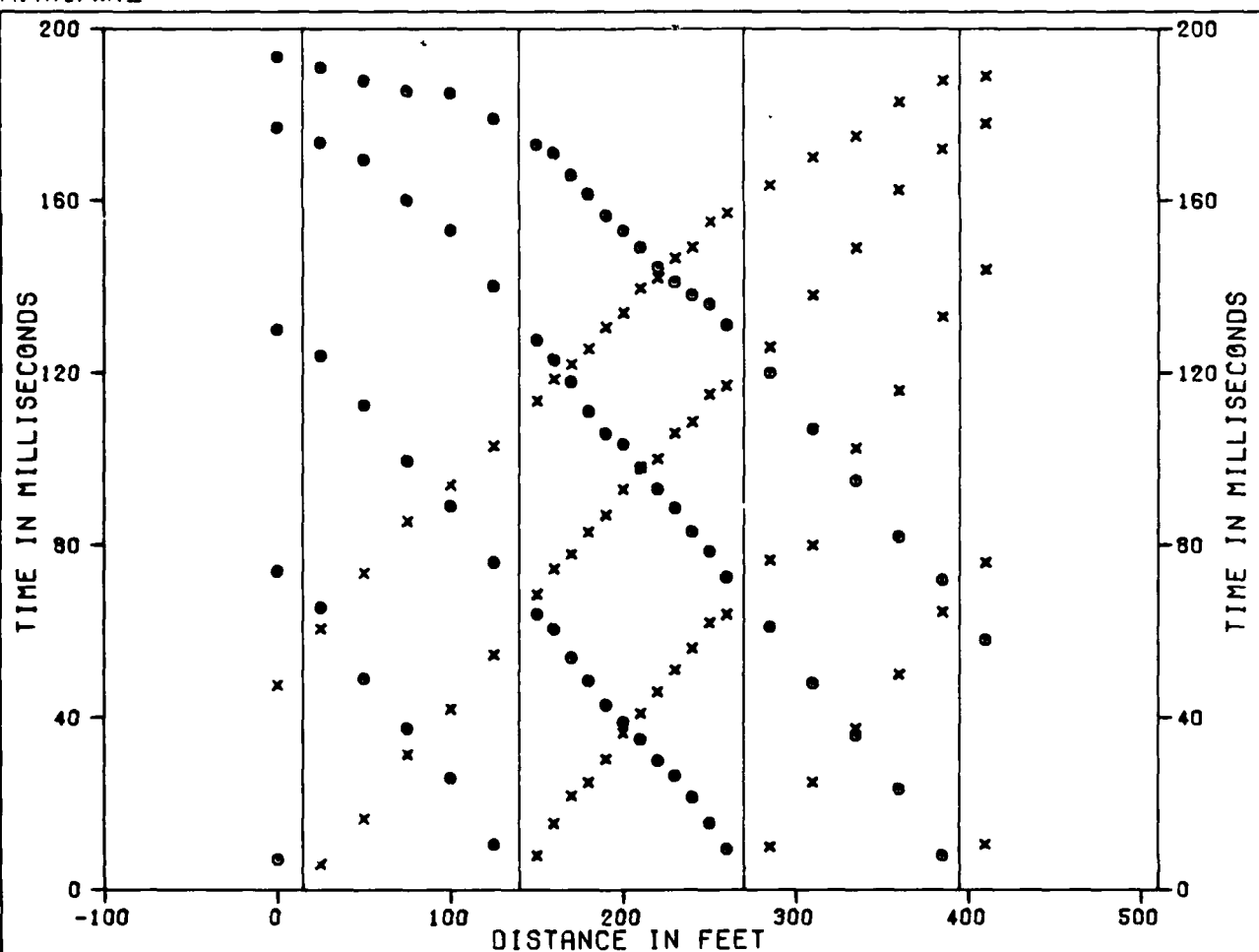


FN-TR-27-WA-II



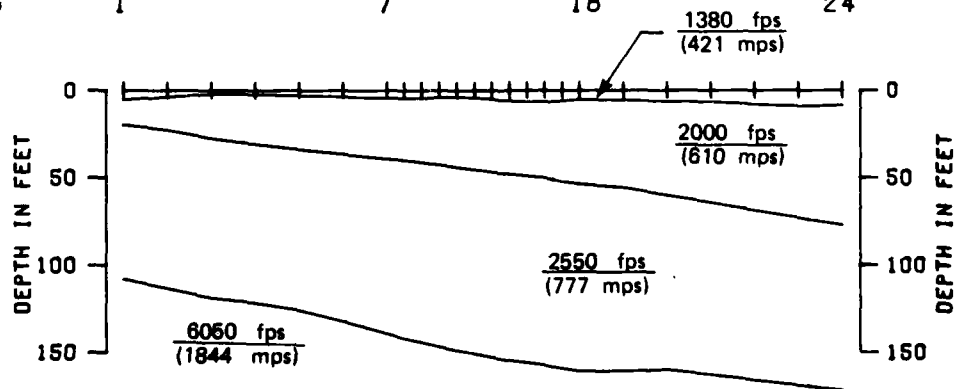
24 MAR 81

FN-TR-27-WA-II



SHOT F
GEOPHONES

G H I J K
1 7 18 24



0 METERS 50
DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE WA-S-8
TIME DISTANCE DATA AND VELOCITY PROFILE
WAH WAH VALLEY, UTAH

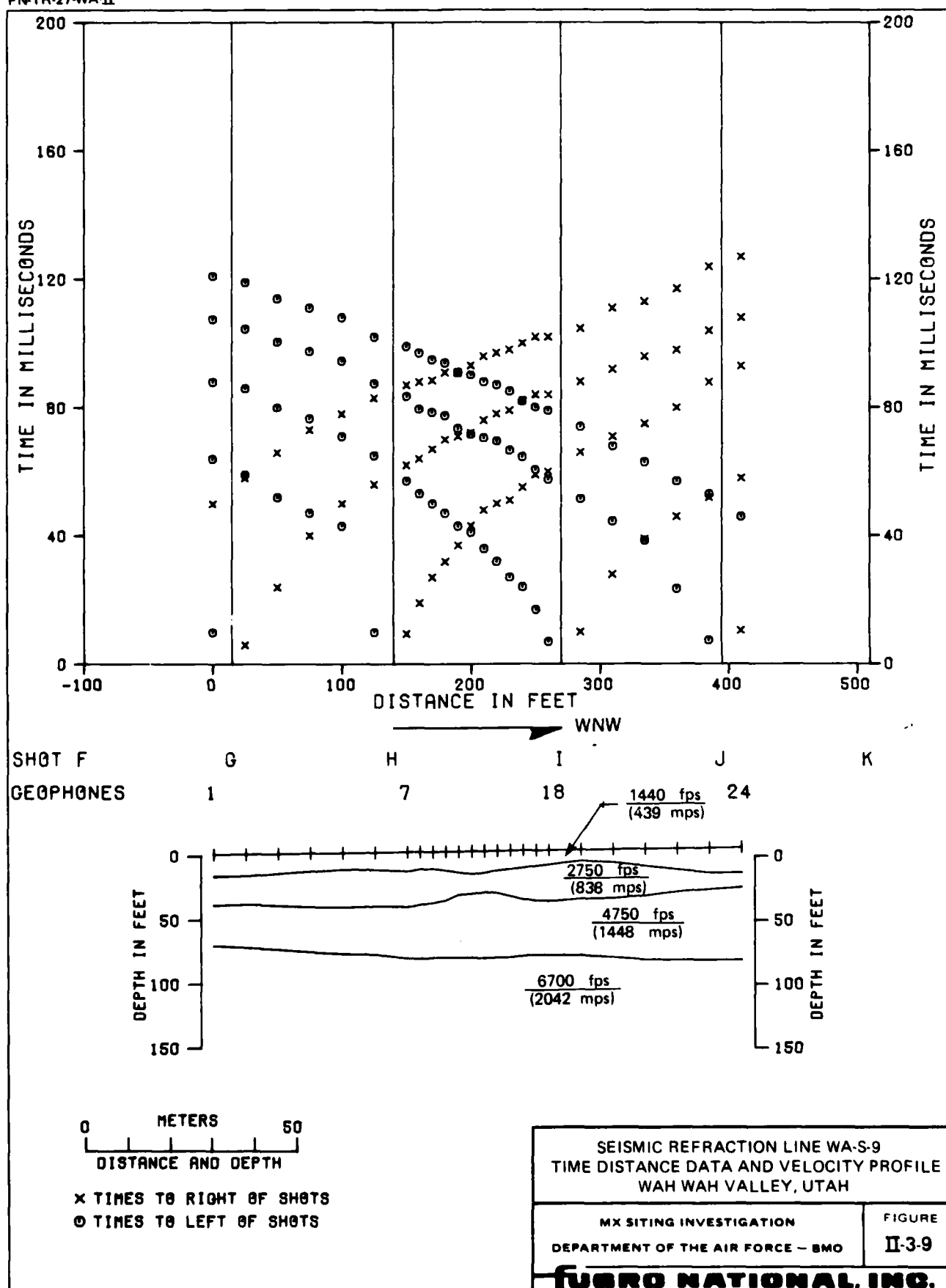
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-3-8

FUGRO NATIONAL, INC.

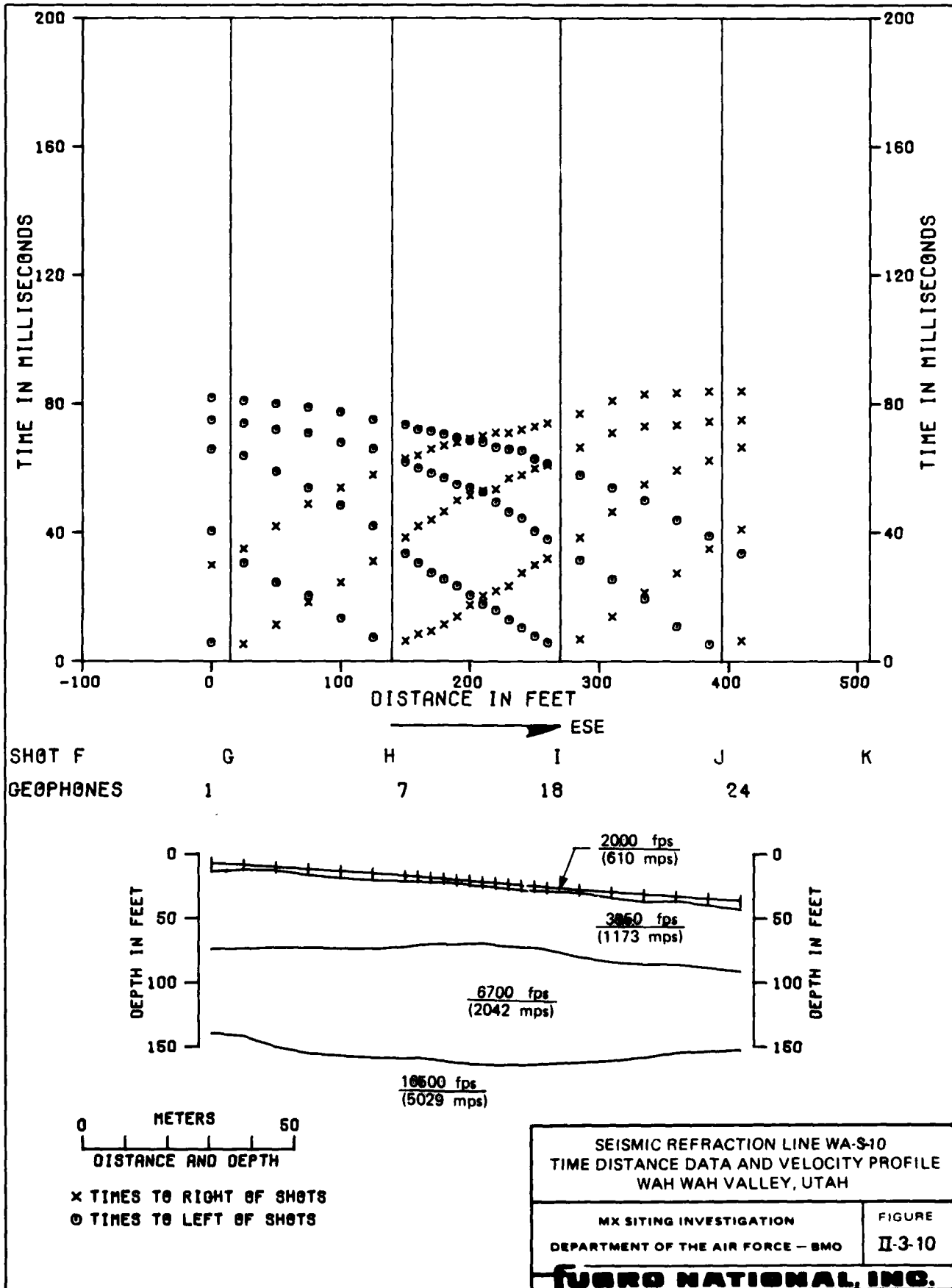
24 MAR 81

FN-TR-27-WA-II



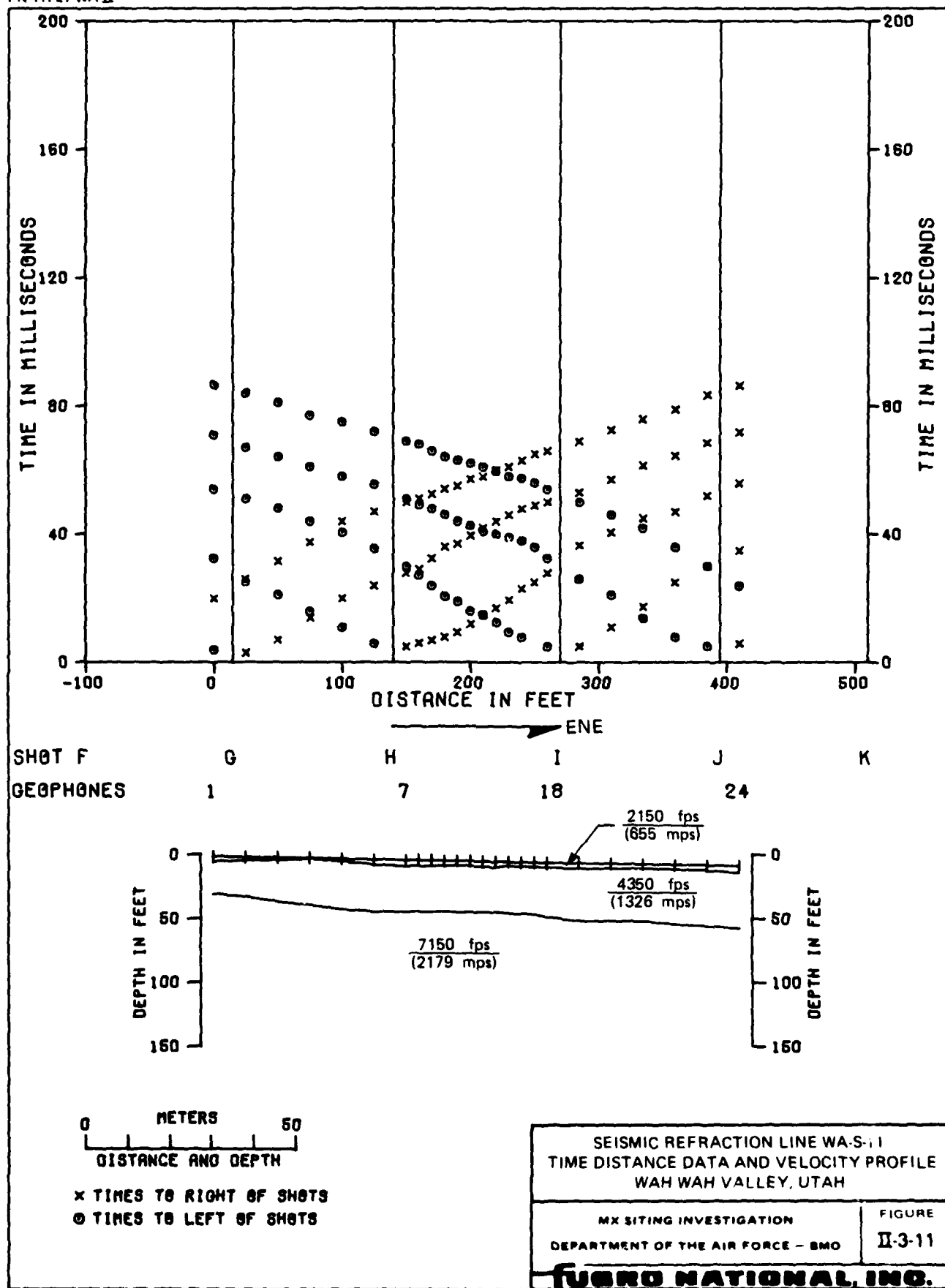
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FN-TR-27-WA-II



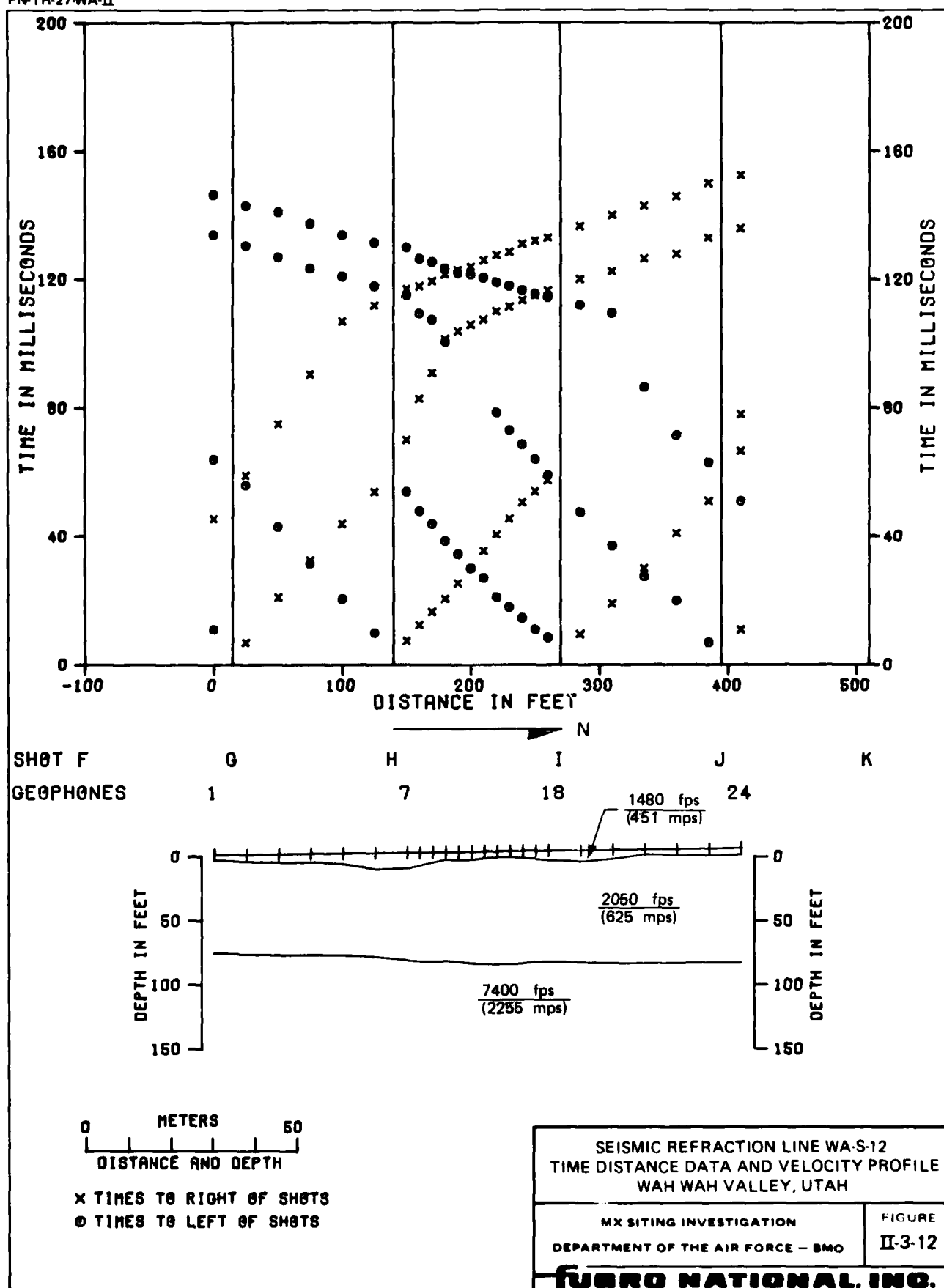
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FN-TR-27-WA-II

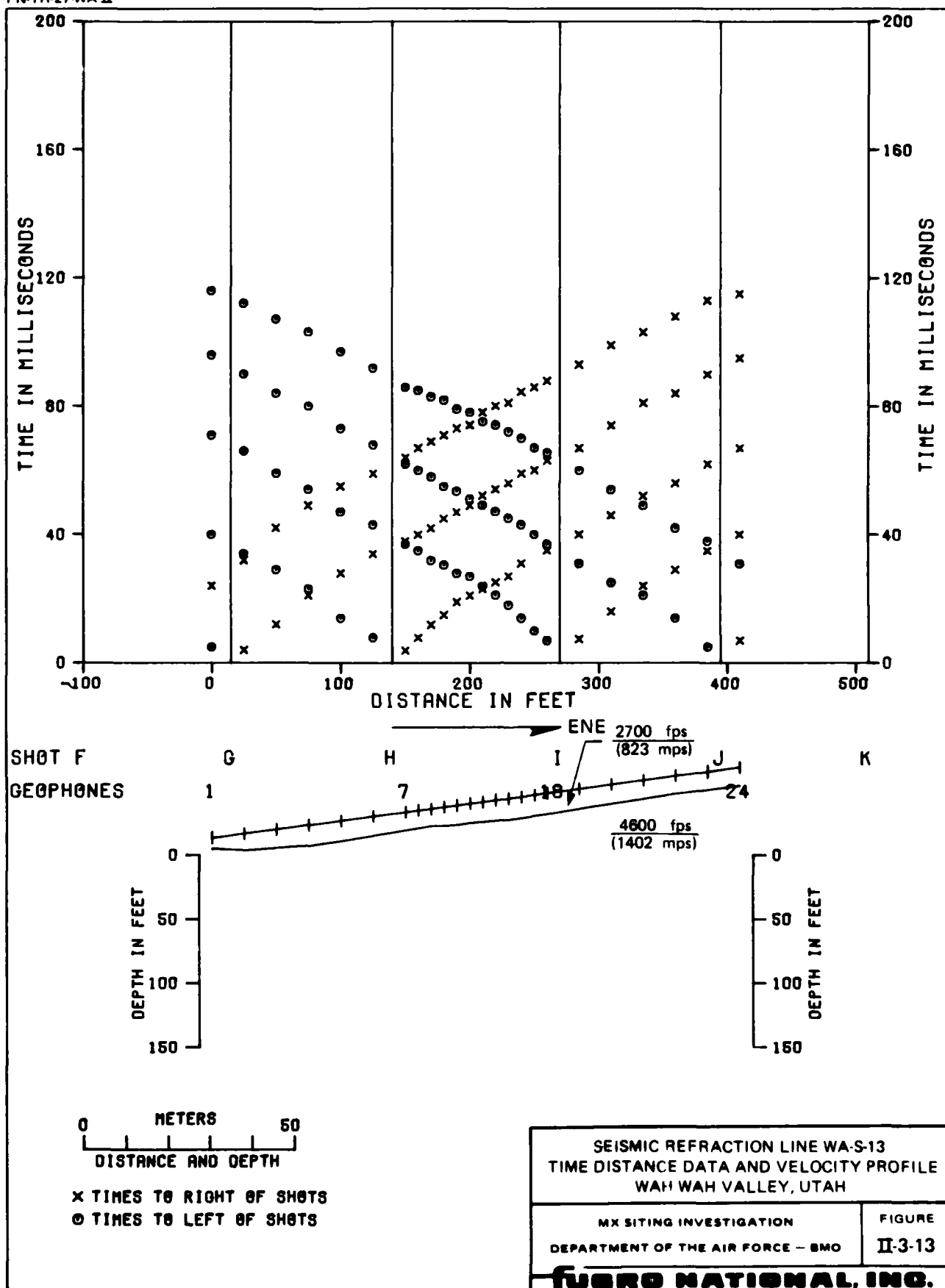


24 MAR 81

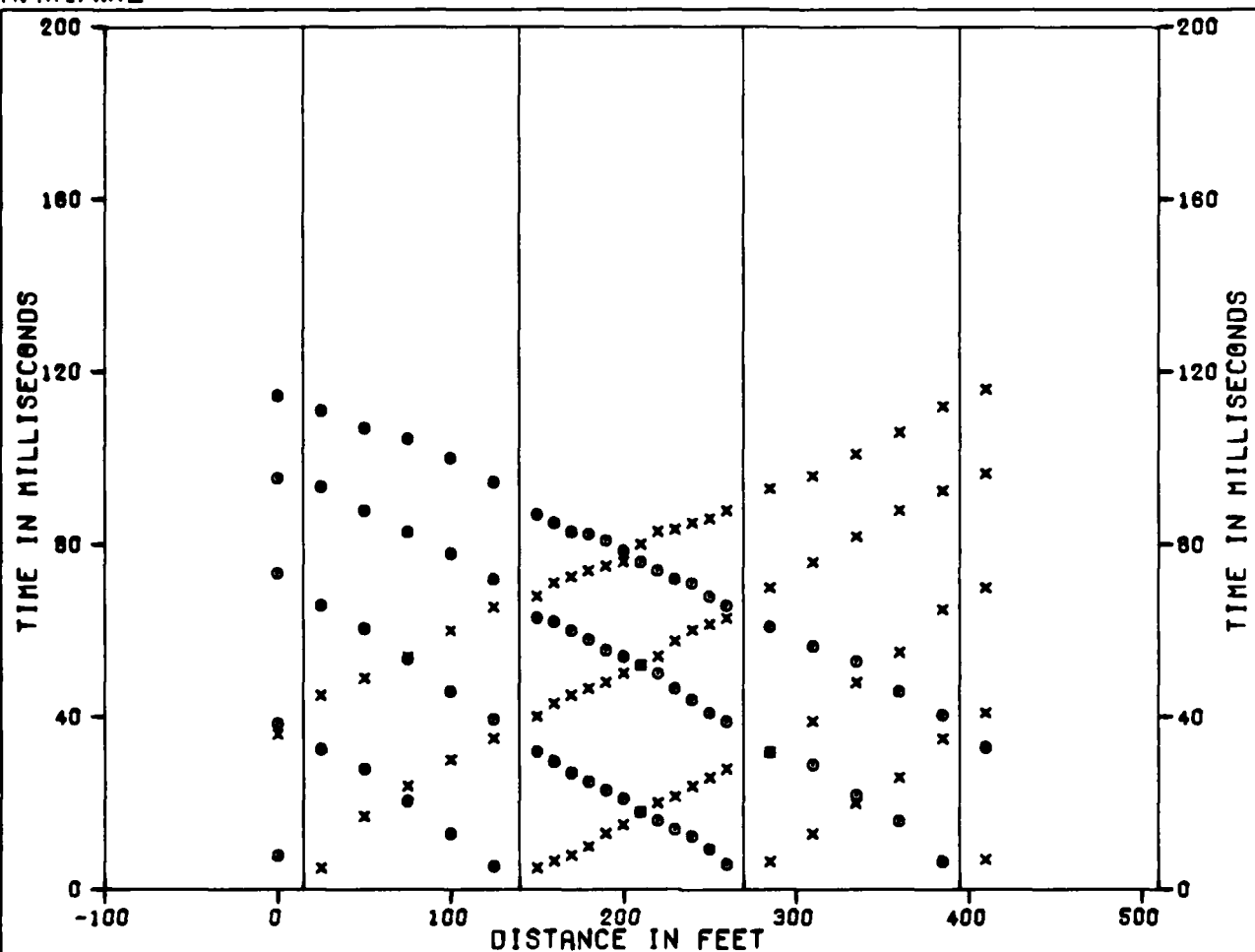
FN-TR-27-WA-II



24 MAR 81



FN-TR-27-WA-II



SHOT F
GEOPHONES

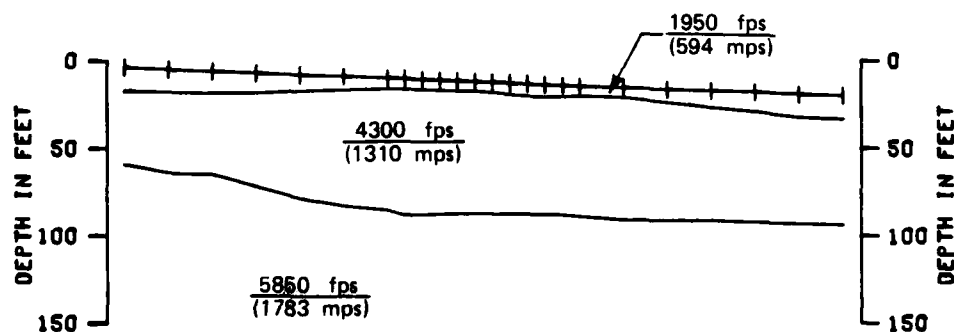
G
1

H
7

I
18

J
24

K



0 METERS 50
DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE WA-S-14
TIME DISTANCE DATA AND VELOCITY PROFILE
WAH WAH VALLEY, UTAH

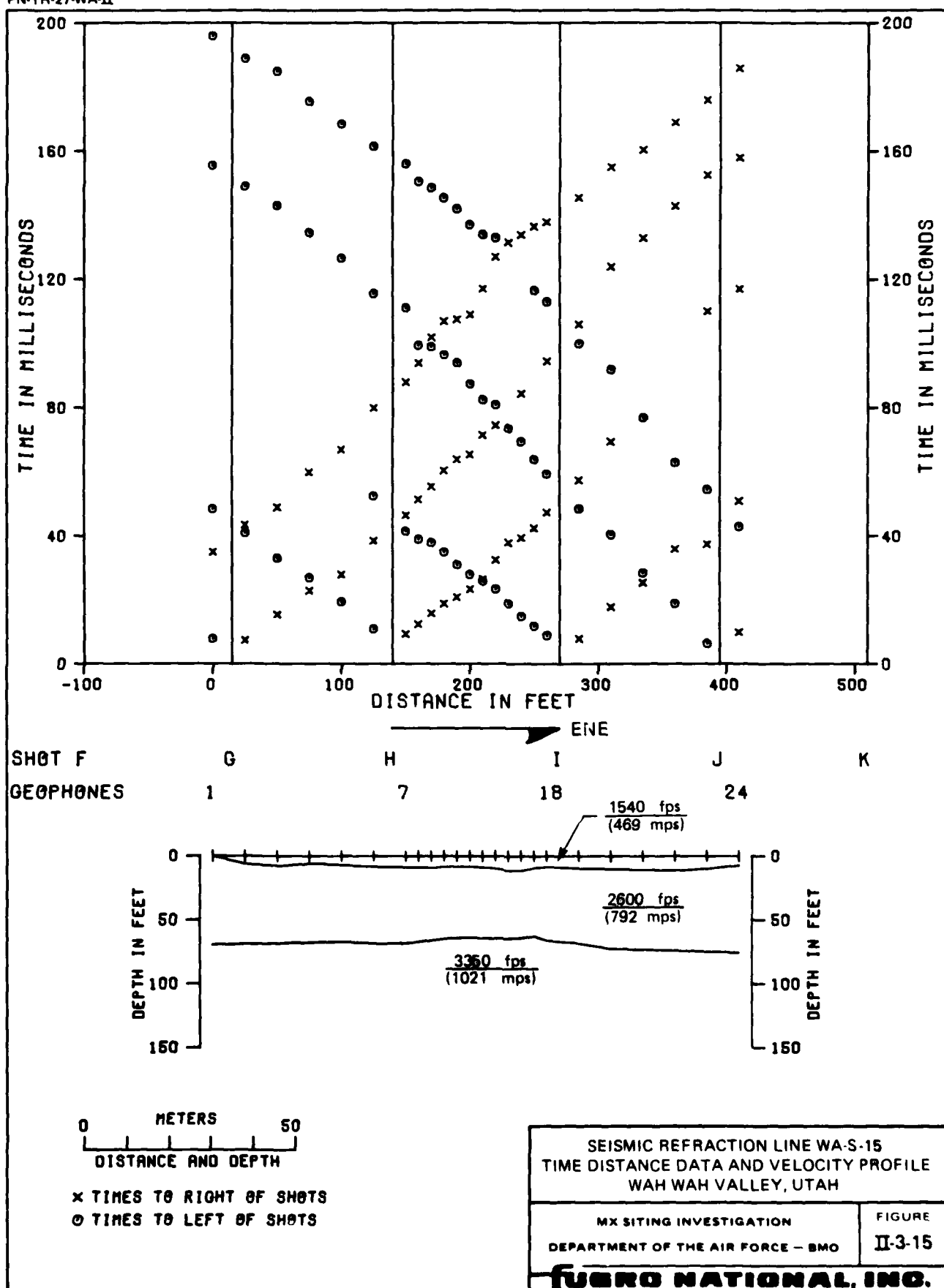
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-3-14

FURRO NATIONAL, INC.

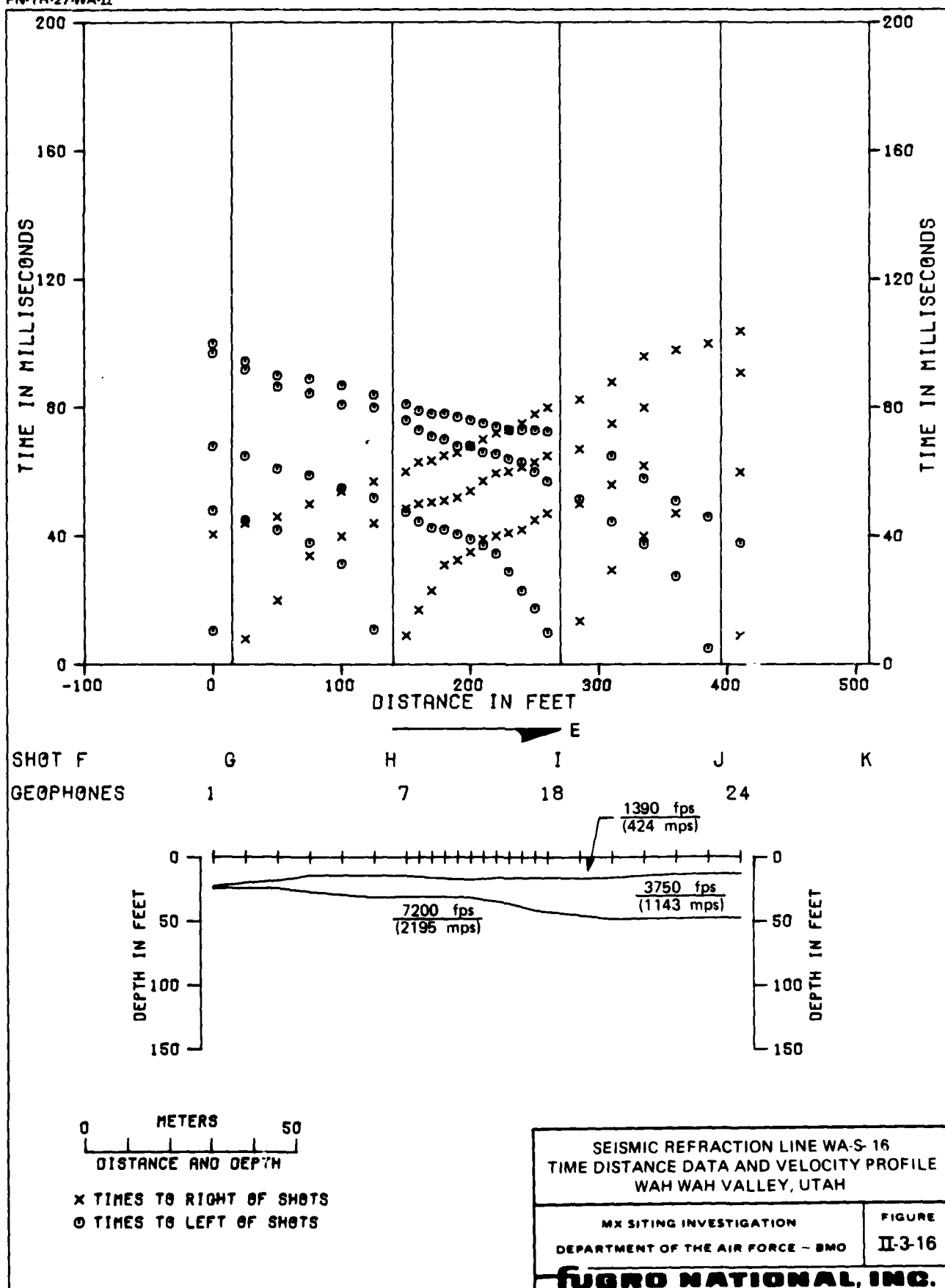
24 MAR 81

FN-TR-27-WA-II



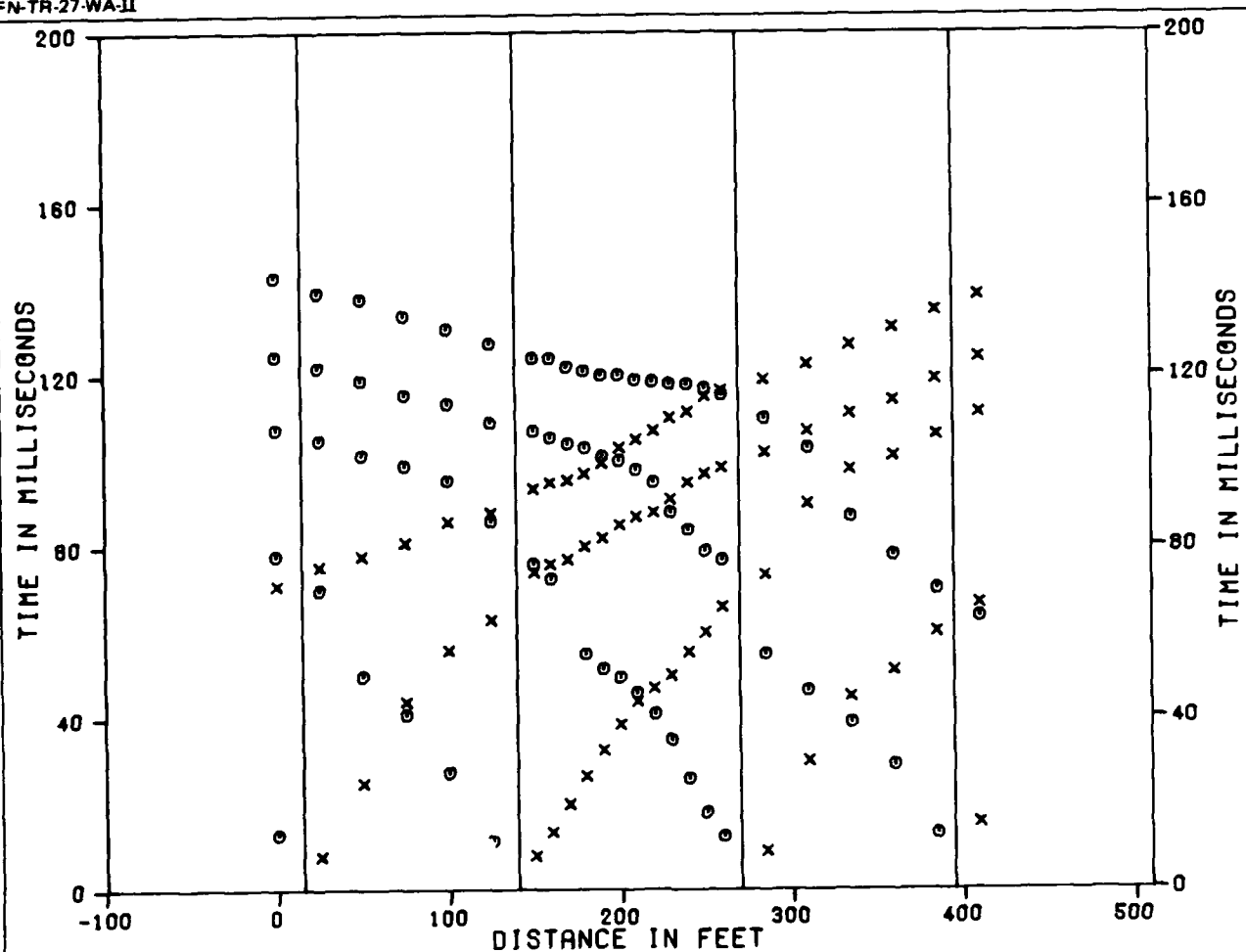
24 MAR 81

FN-YR-27-WA-II

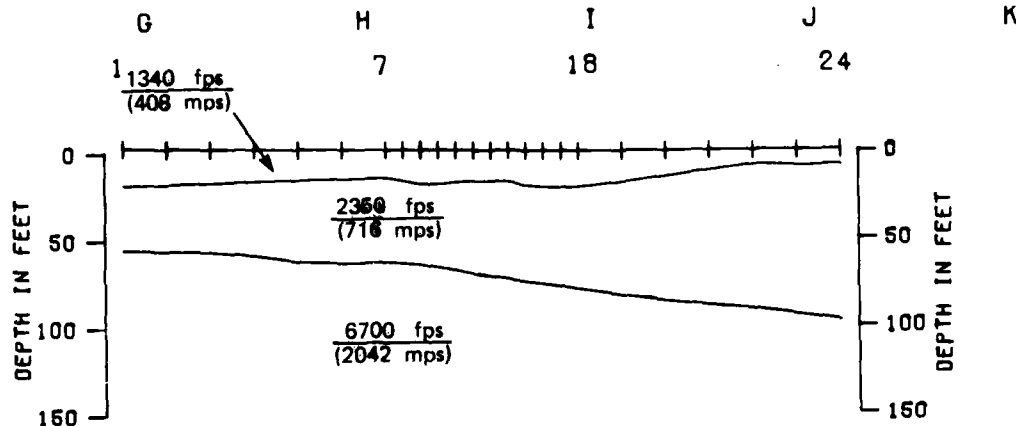


24 MAR 81

FN-TR-27-WA-II



SHOT F
GEOPHONES



0 METERS 50
DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE WA-S-17
TIME DISTANCE DATA AND VELOCITY PROFILE
WAH WAH VALLEY, UTAH

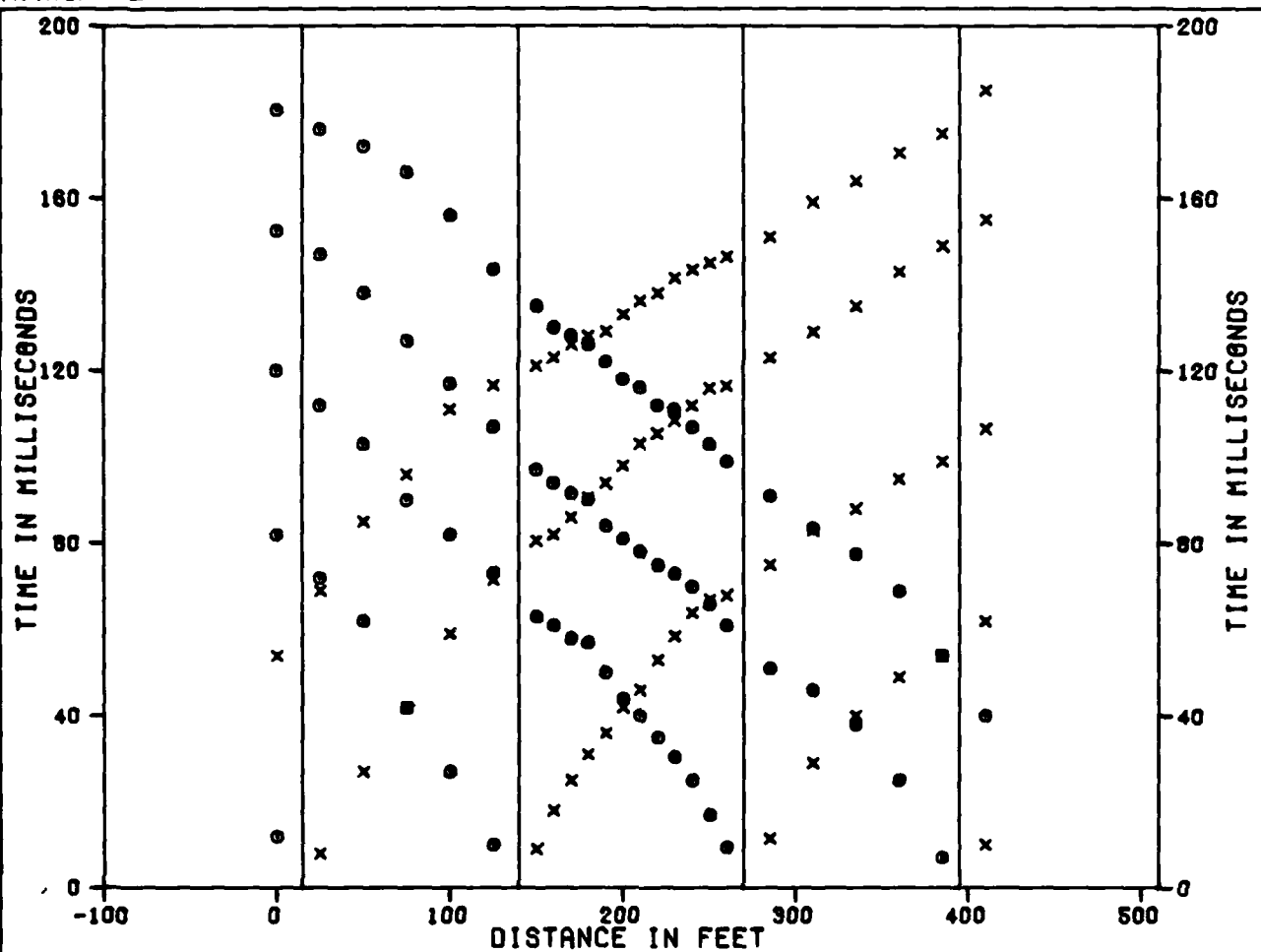
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE -- BMO

FIGURE
II-3-17

FUEBO NATIONAL, INC.

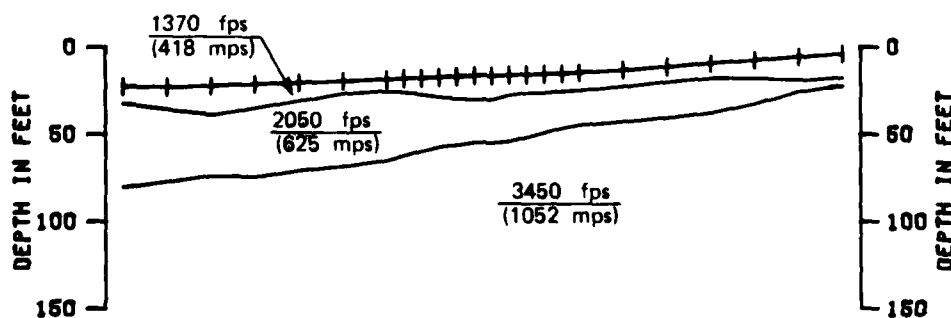
24 MAR 81

FN-TR-27-WA-II



SHOT F
GEOPHONES

0 1 H 7 I 18 J 24 K



0 METERS 50
DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

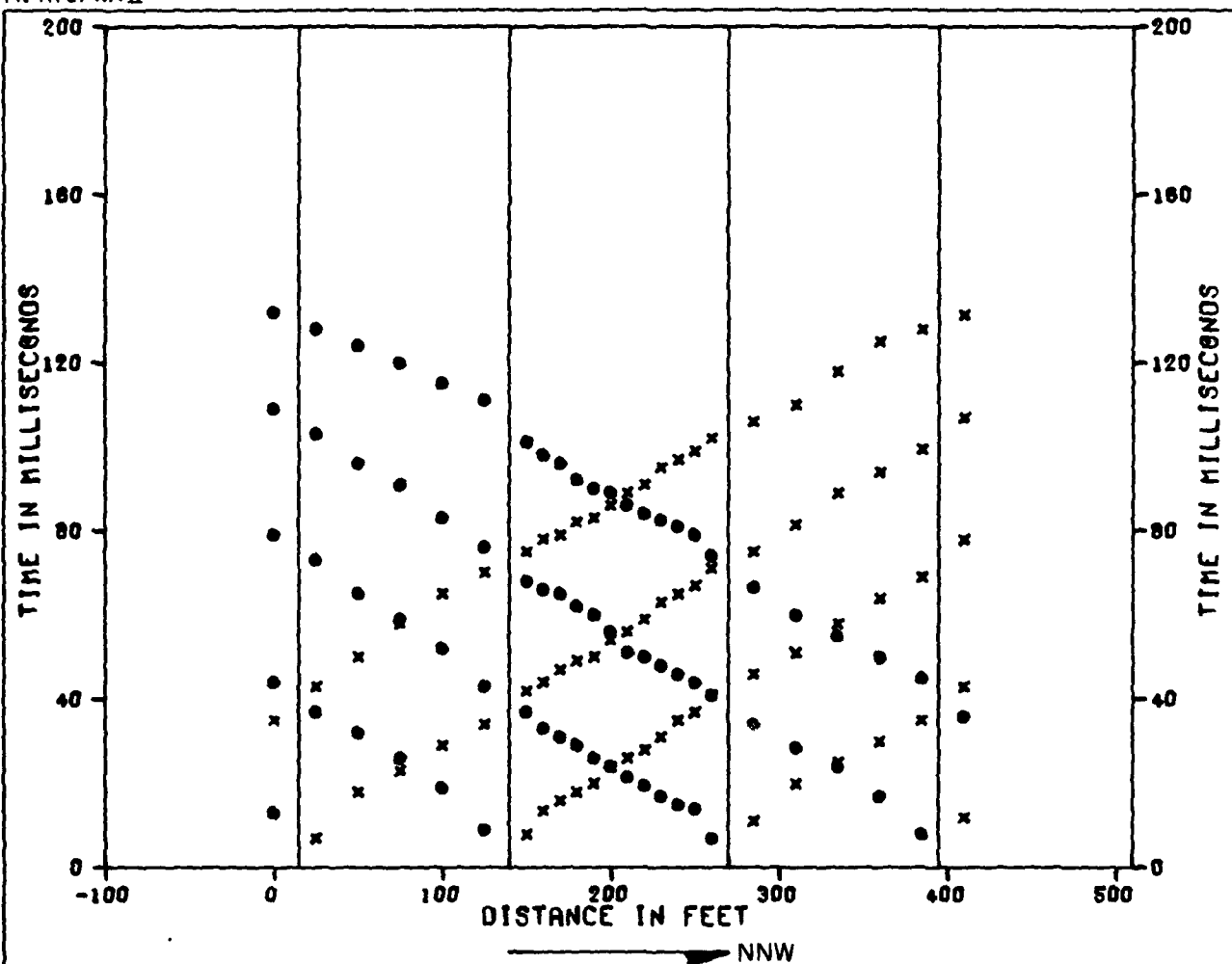
SEISMIC REFRACTION LINE WA-S-18
TIME DISTANCE DATA AND VELOCITY PROFILE
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

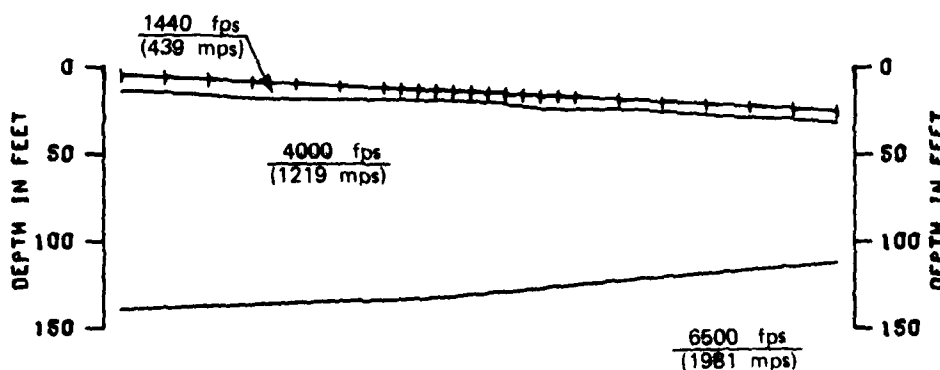
FIGURE
II-3-18

FUGRO NATIONAL, INC.

24 MAR 81



SHOT F
G H I J K
GEOPHONES 1 7 18 24



0 METERS 50
DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE WA-S-19
TIME DISTANCE DATA AND VELOCITY PROFILE
WAH WAH VALLEY, UTAH

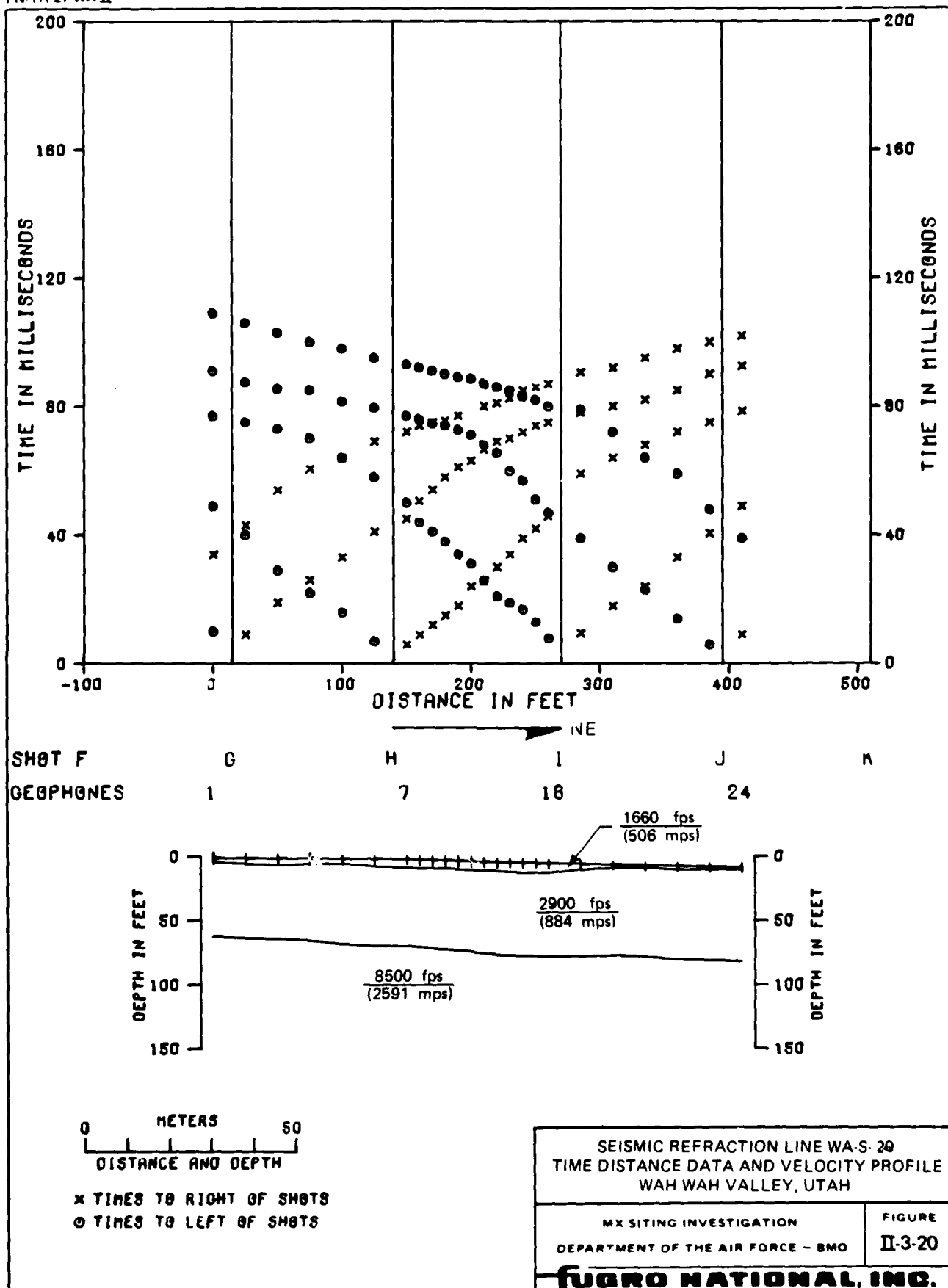
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-3-19

FUGRO NATIONAL, INC.

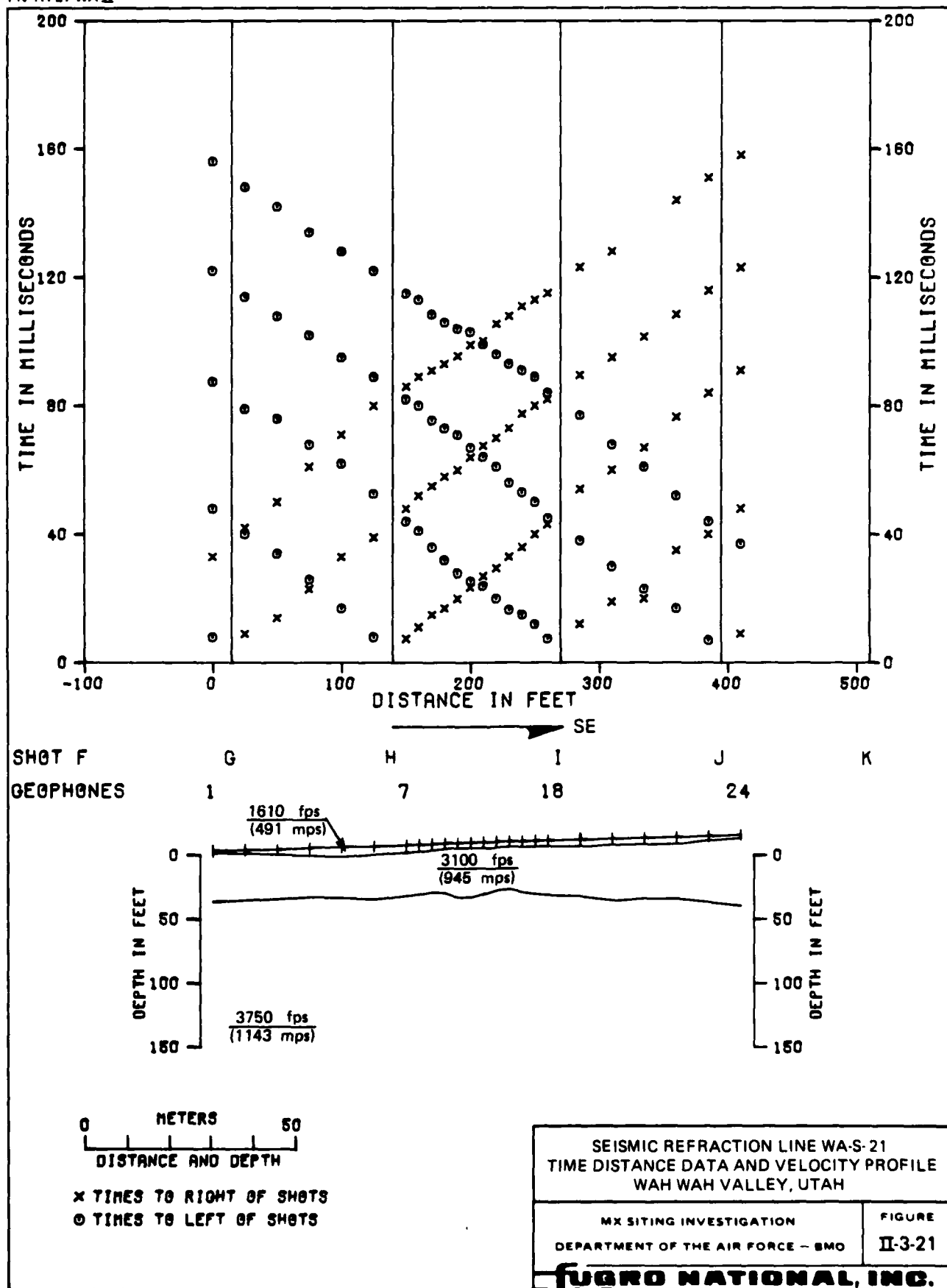
24 MAR 81

FN-TR-27-WA-II



24 MAR 81

FN-TR-27-WA-II



24 MAR 81

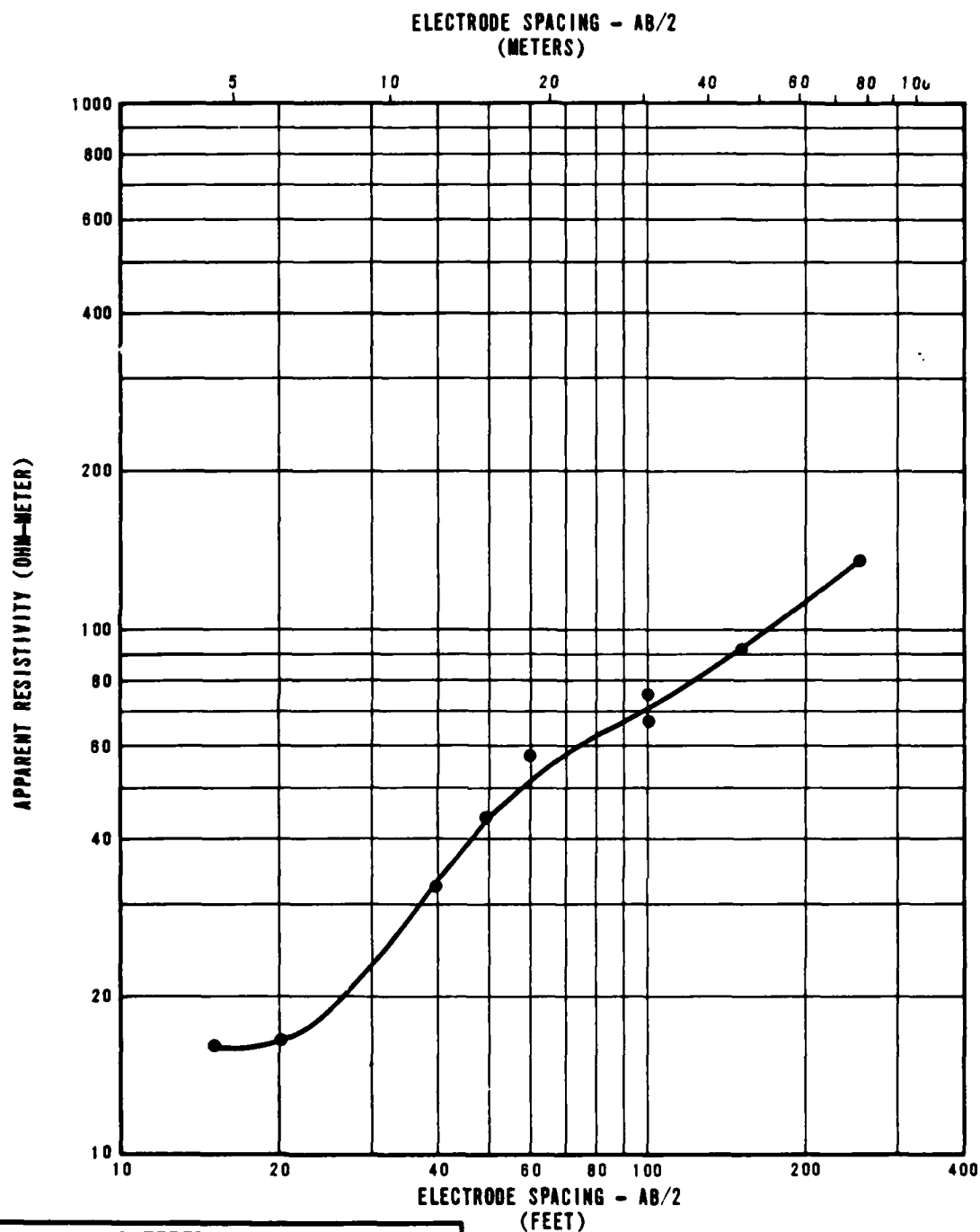
4.0 ELECTRICAL RESISTIVITY DATA

Explanation: Each figure in this section presents the data obtained from a resistivity sounding and a tabulated model of resistivity layers that would produce a curve similar to the observed curve.

The upper portion of the figures is a graph in which measured apparent resistivity values in ohm-meters are plotted versus one-half the distance between the current electrodes.

The interpreted model tabulated at the bottom of the page shows a combination of true resistivity layers and thicknesses obtained by matching theoretical curves to the field curve.

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	16
13	4	86
34	10	170
66	20	260

**RESISTIVITY SOUNDING WA-R-1
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

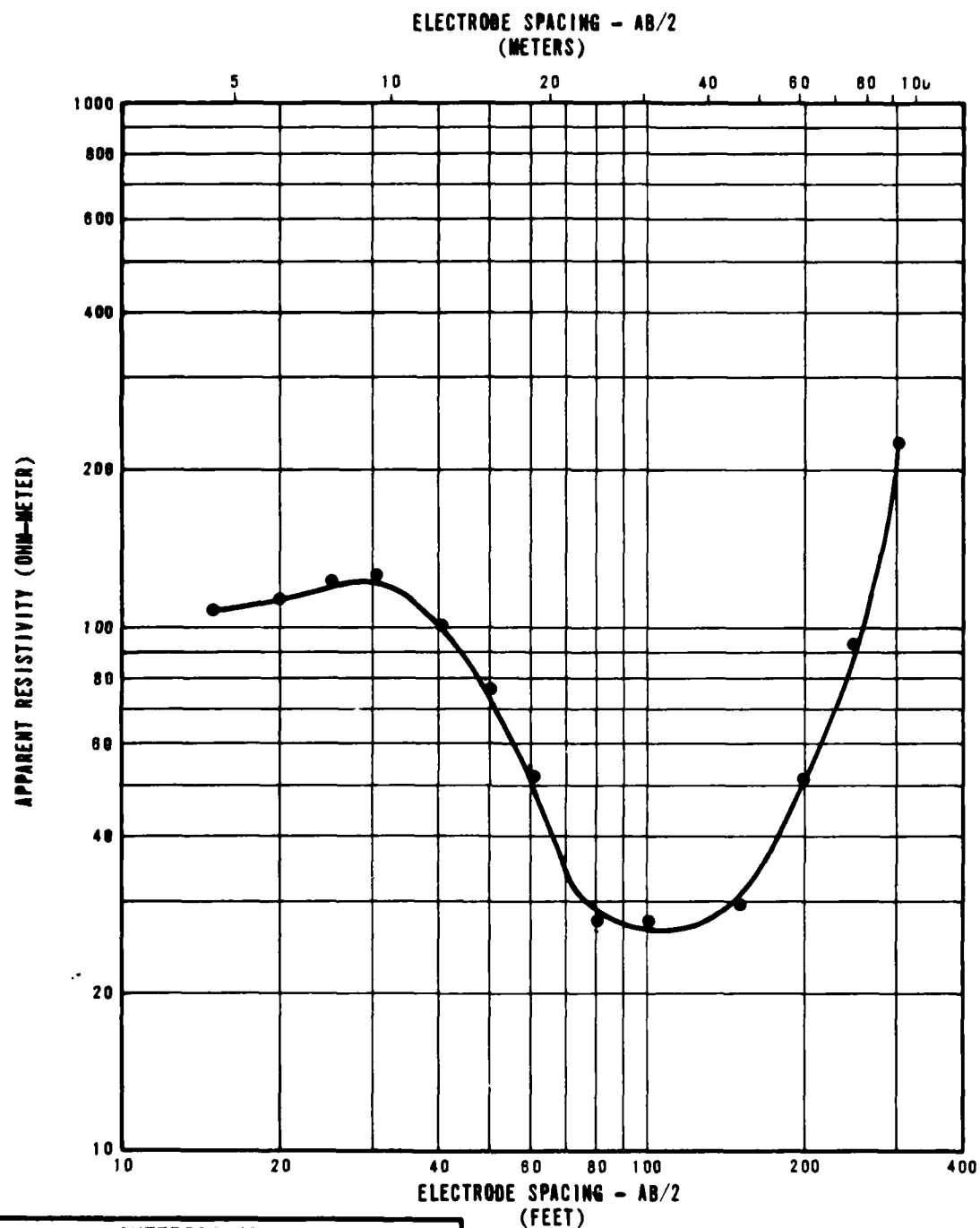
FIGURE
II-4-1

FUSCO NATIONAL INC.

24 MAR 81

USAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	110
24	7	13
48	14	100
92	28	640

**RESISTIVITY SOUNDING WA-R-2
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE DMO

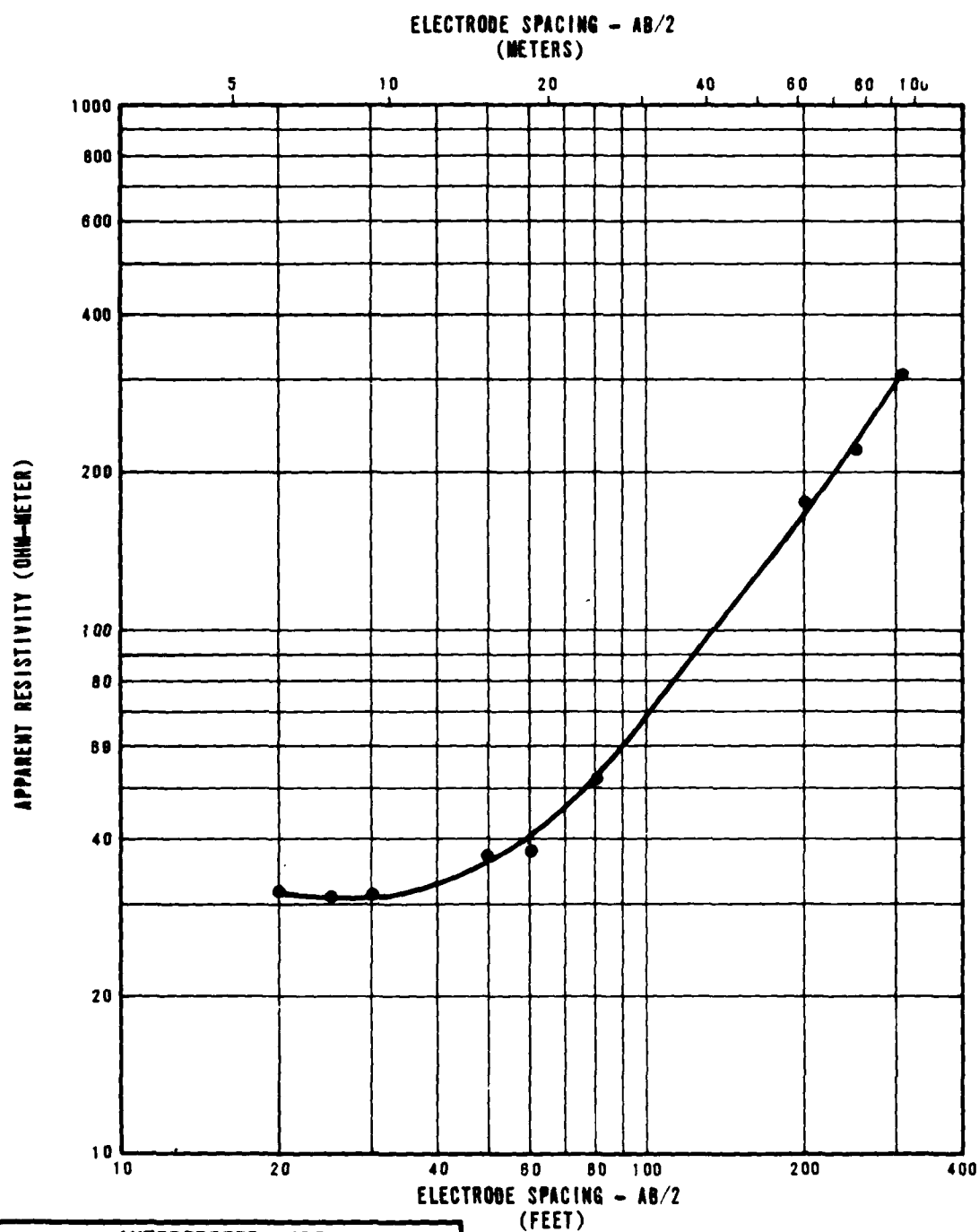
FIGURE
II-4-2

FLUORO NATIONAL, INC.

24 MAR 81

USAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	30
32	10	55
44	13	340
73	22	950

RESISTIVITY SOUNDING WA-1-3
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE 040

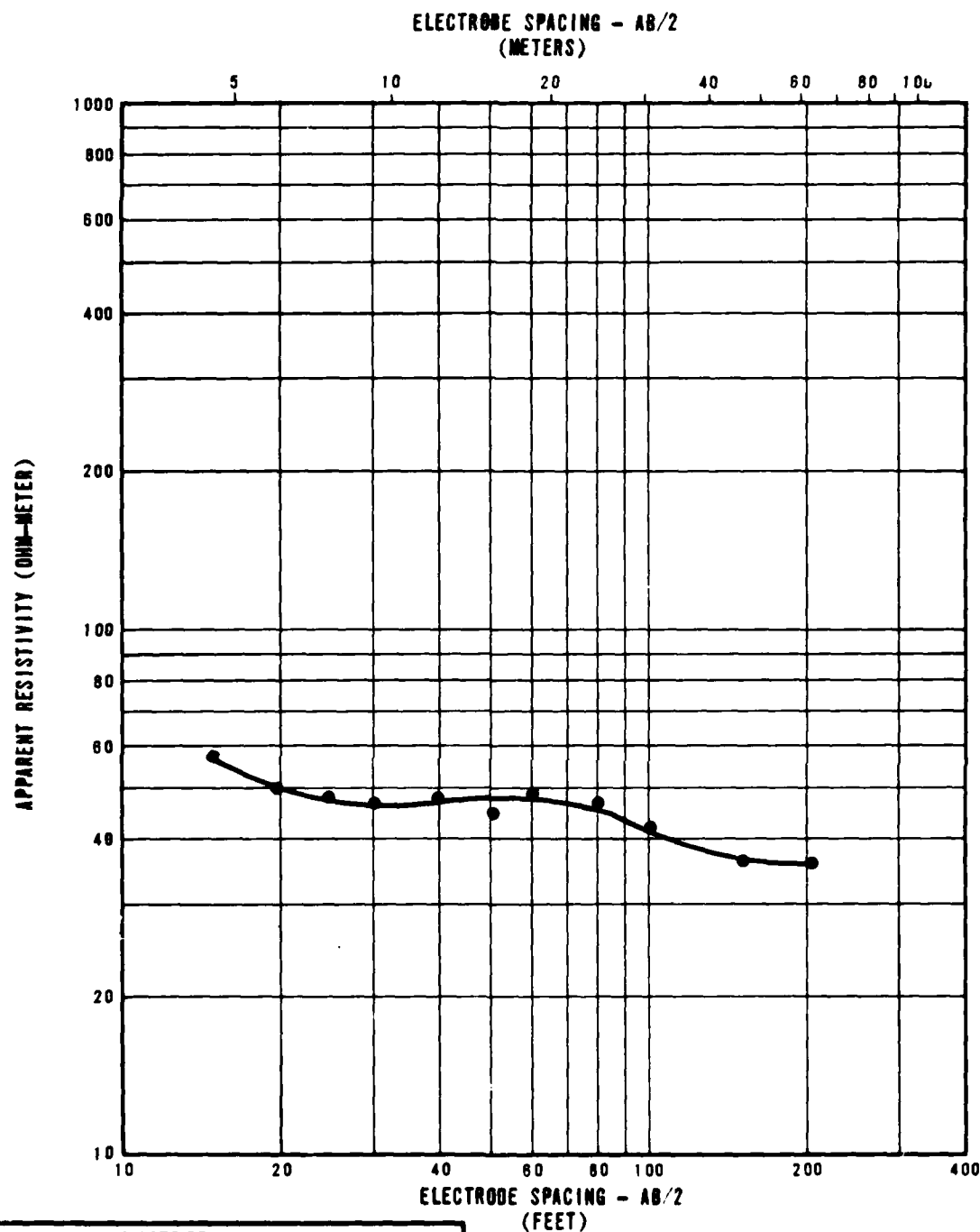
FIGURE
II-4-3

FUGRO NATIONAL INC.

24 MAR 81

USAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	60
14	4	40
21	6	50
60	18	30

**RESISTIVITY SOUNDING WA-R-4
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE DMO

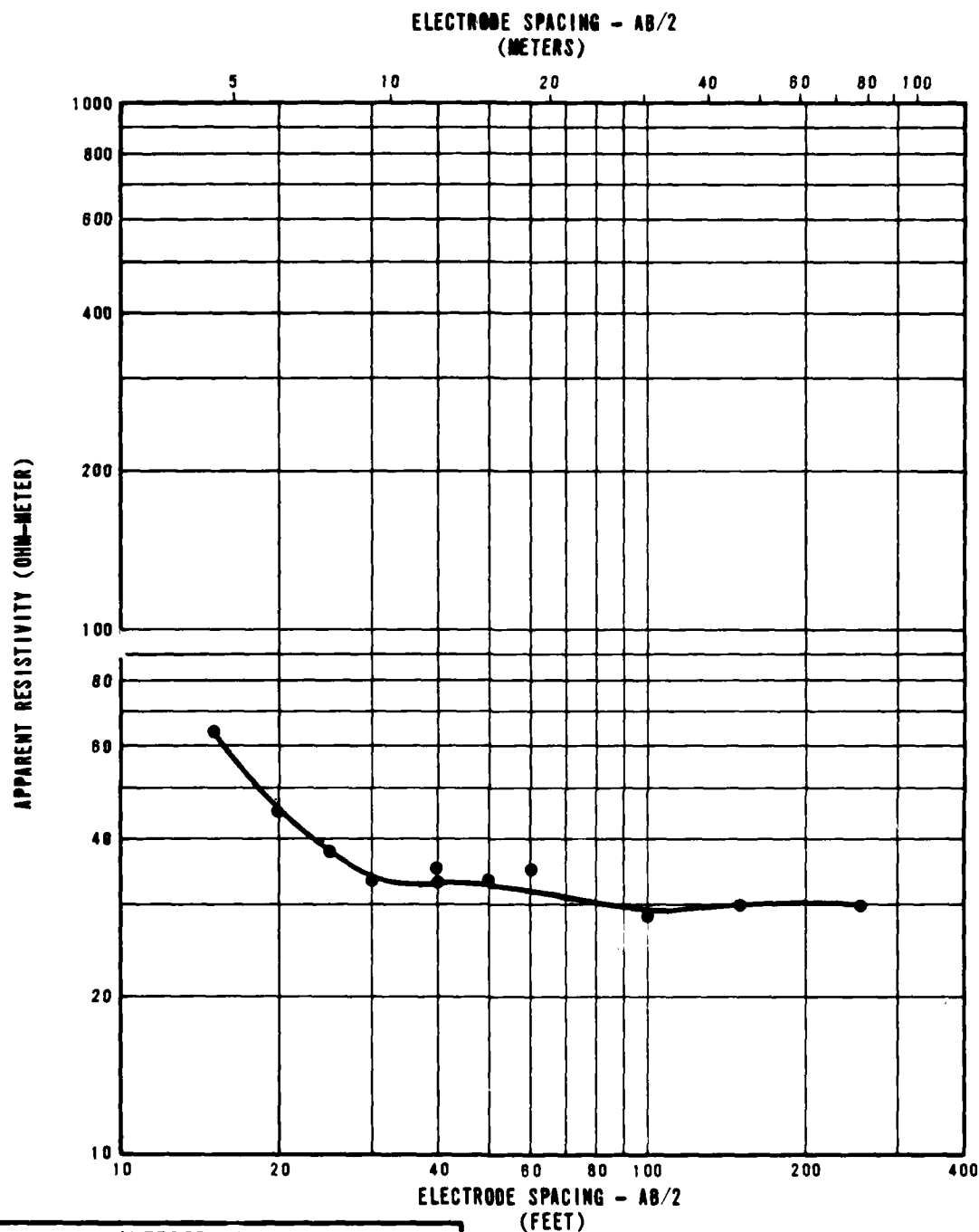
FIGURE
II-4-4

FUSCO NATIONAL INC.

24 MAR 81

USAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	115
8	2	30
36	11	12
47	14	45
93	28	15

RESISTIVITY SOUNDING WA-R-5
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE DMO

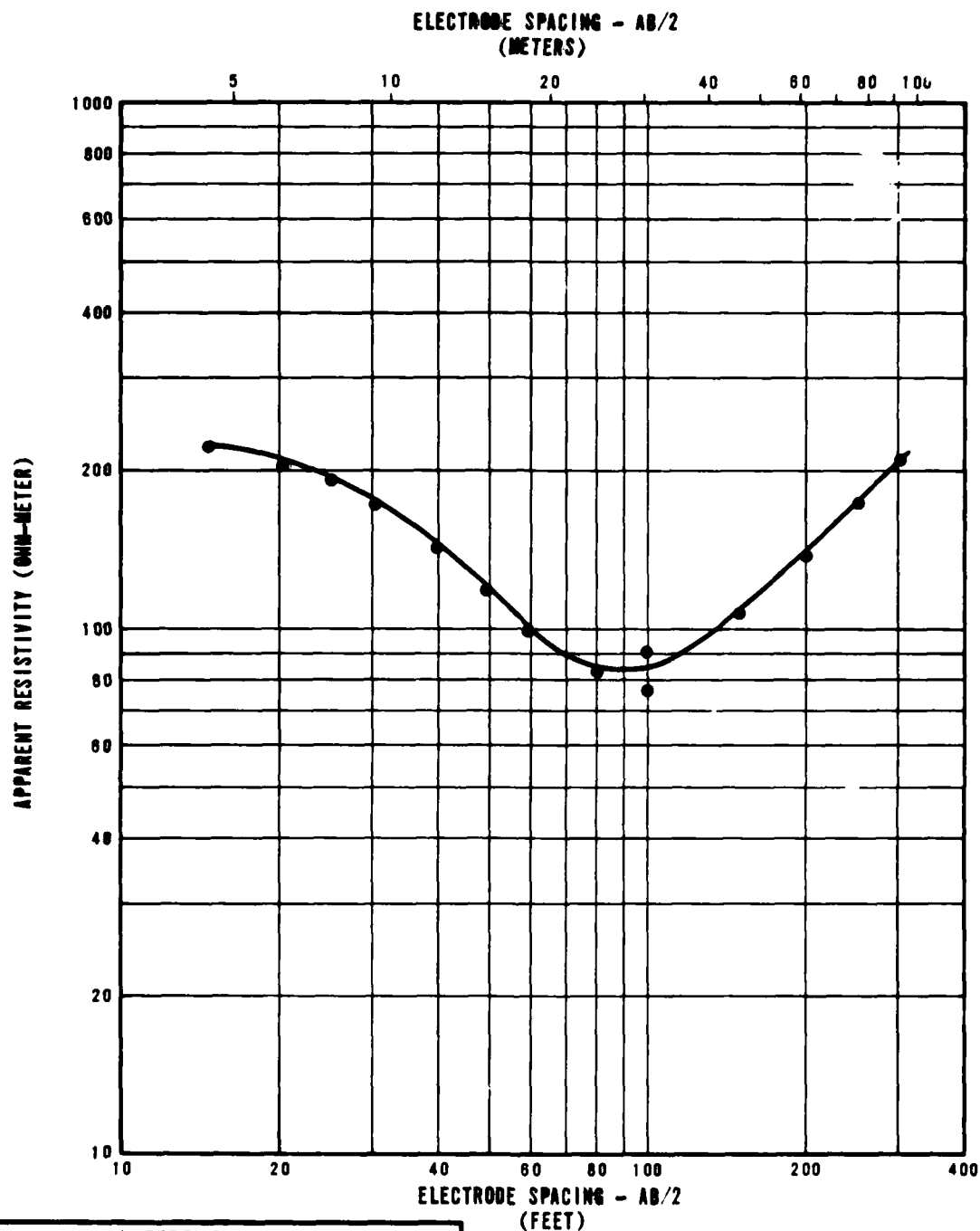
FIGURE
II-4-5

FURRO NATIONAL INC.

24 MAR 81

UOA F-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	200
17	5	100
28	9	40
56	17	85
83	25	340

RESISTIVITY SOUNDING WA-R-8
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

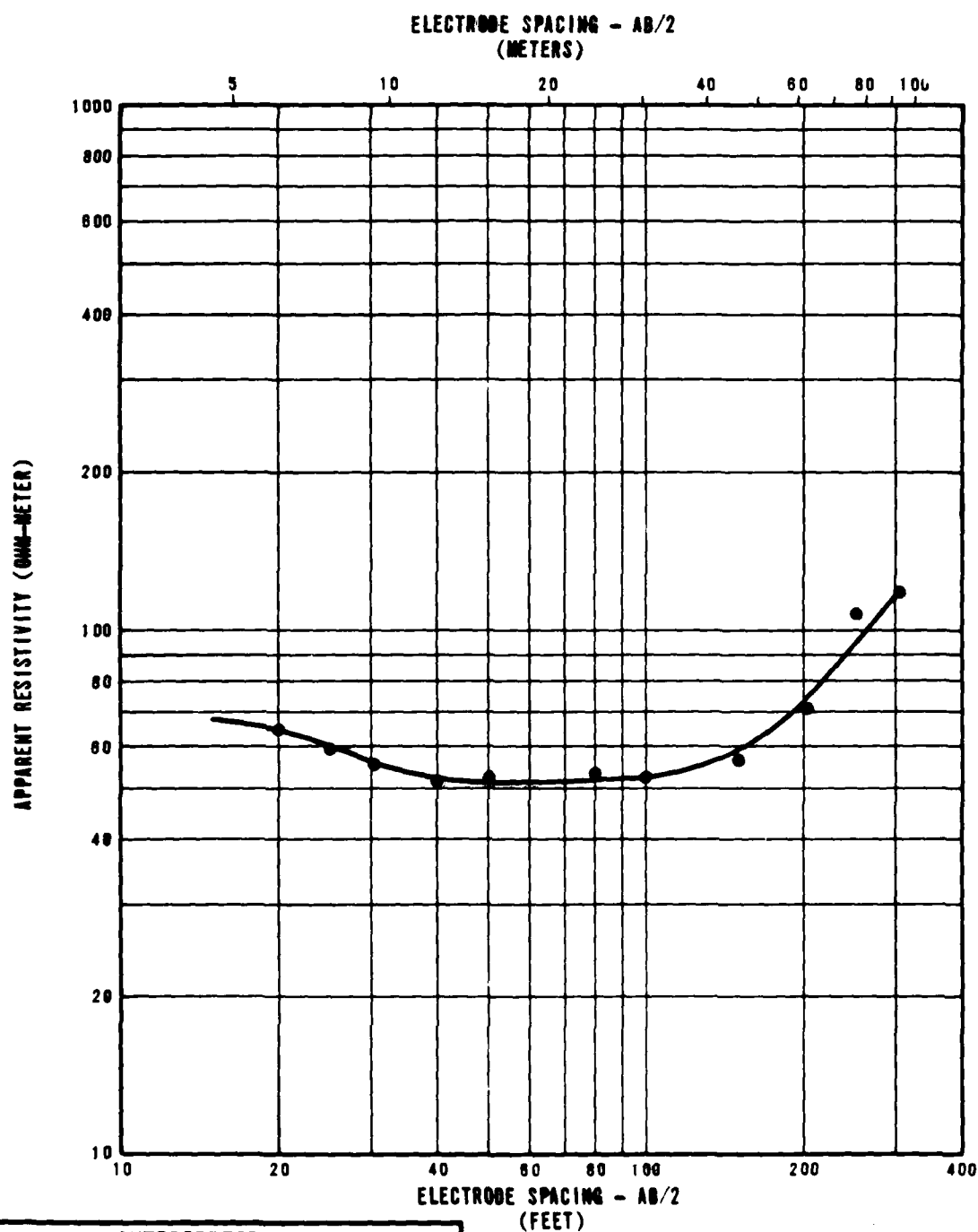
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE DMO

FIGURE
II-4-6

FUGRO NATIONAL, INC.

24 MAR 81

USAF-18



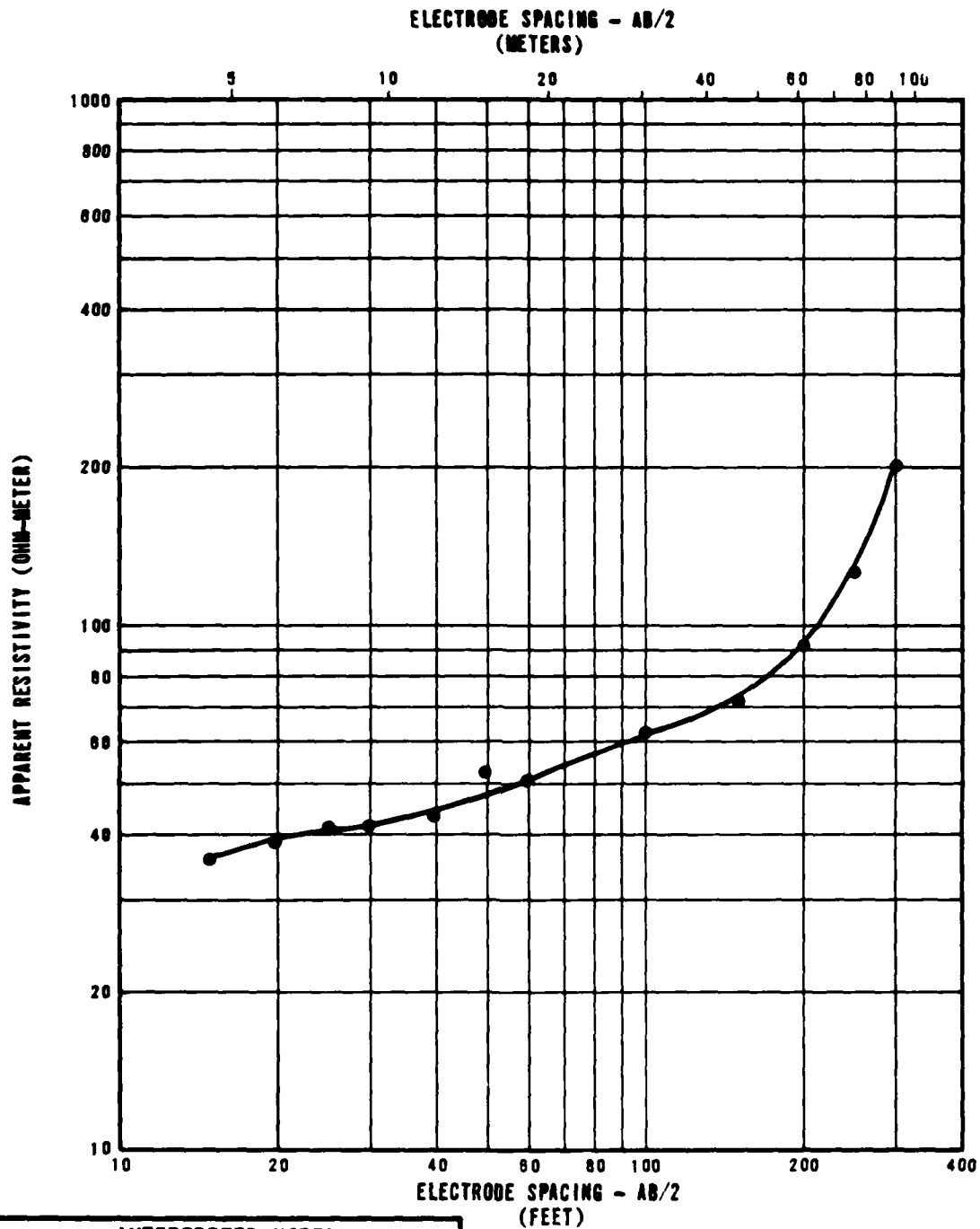
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	70
8	2	25
62	19	730

RESISTIVITY SOUNDING WA-R-7
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE 880

FIGURE
II-4-7

FUSION NATIONAL INC.



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	30
18	5	90
34	10	80
112	34	300

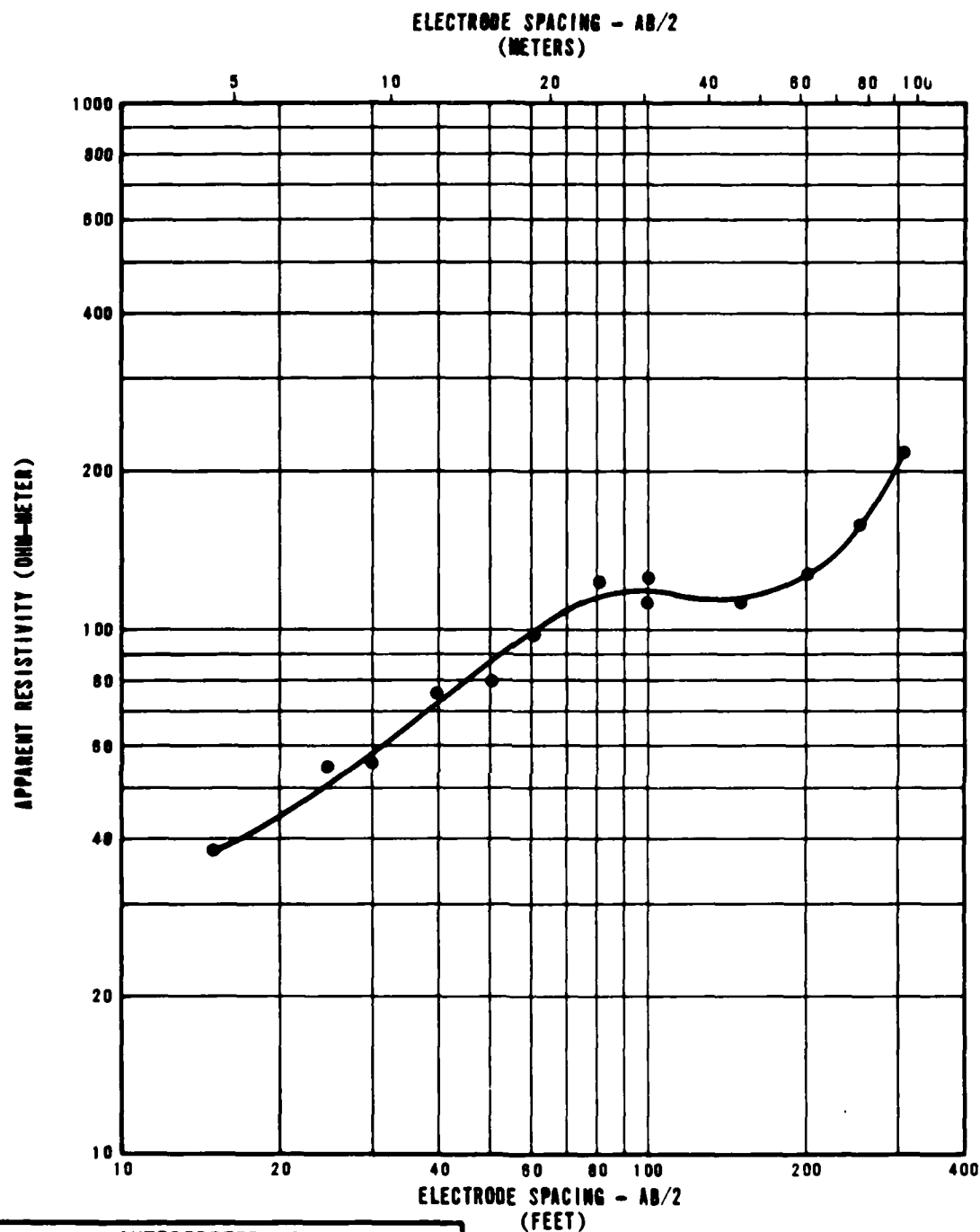
**RESISTIVITY SOUNDING WA-R-8
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-8

FUBRO NATIONAL, INC.

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	30
8	2	140
25	8	880
29	9	300
36	11	70

**RESISTIVITY SOUNDING WA-R-9
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

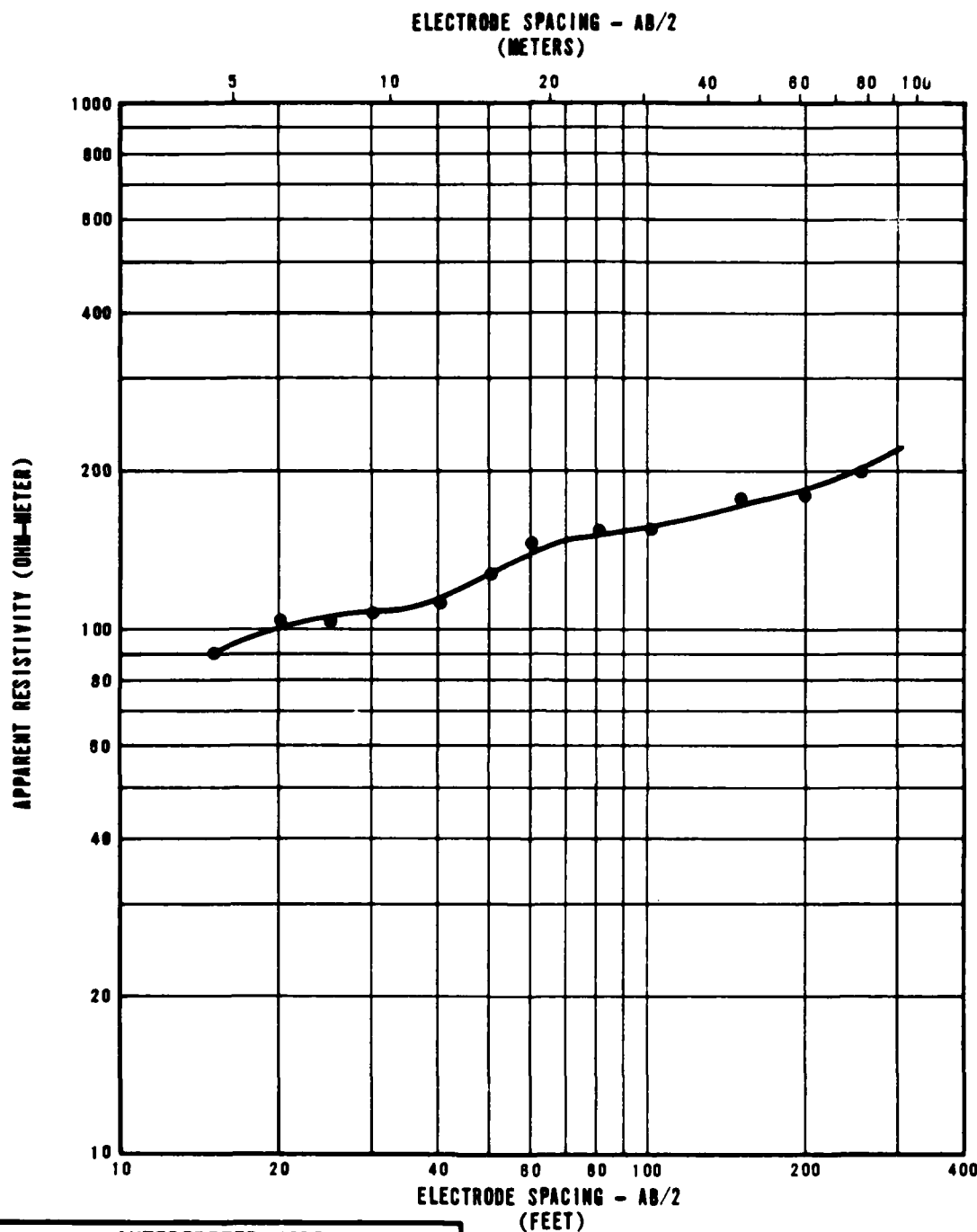
FIGURE
II-4-9

FURRO NATIONAL INC.

24 MAR 81

USAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	65
5	2	130
17	5	60
27	8	1180
34	10	150
170	52	1000

RESISTIVITY SOUNDING WA-R-10
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

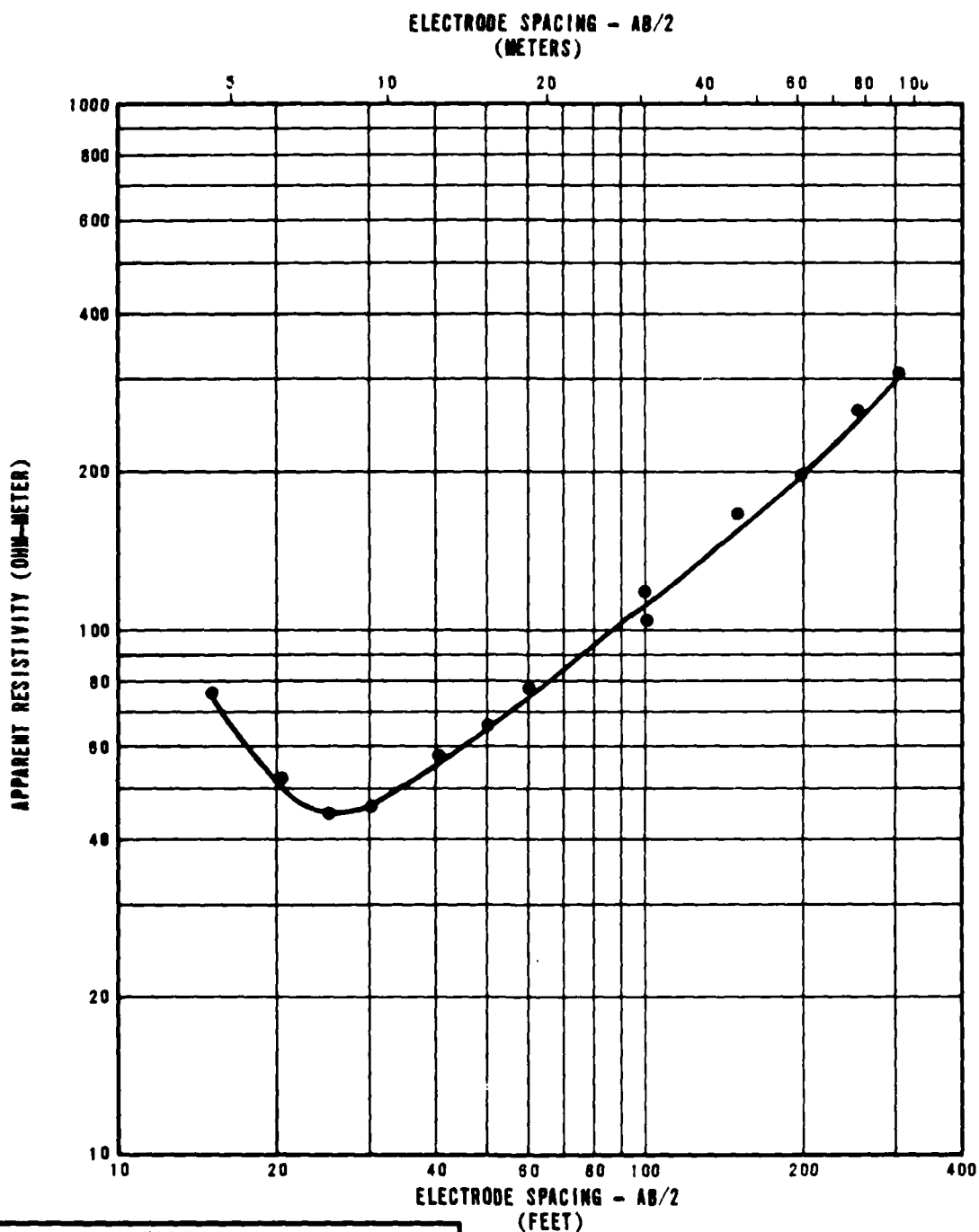
FIGURE
II-4-10

FURRO NATIONAL INC.

24 MAR 81

USAF-18

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	130
6	2	50
27	8	180
55	17	800
92	28	1750

RESISTIVITY SOUNDING WA-R-17
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

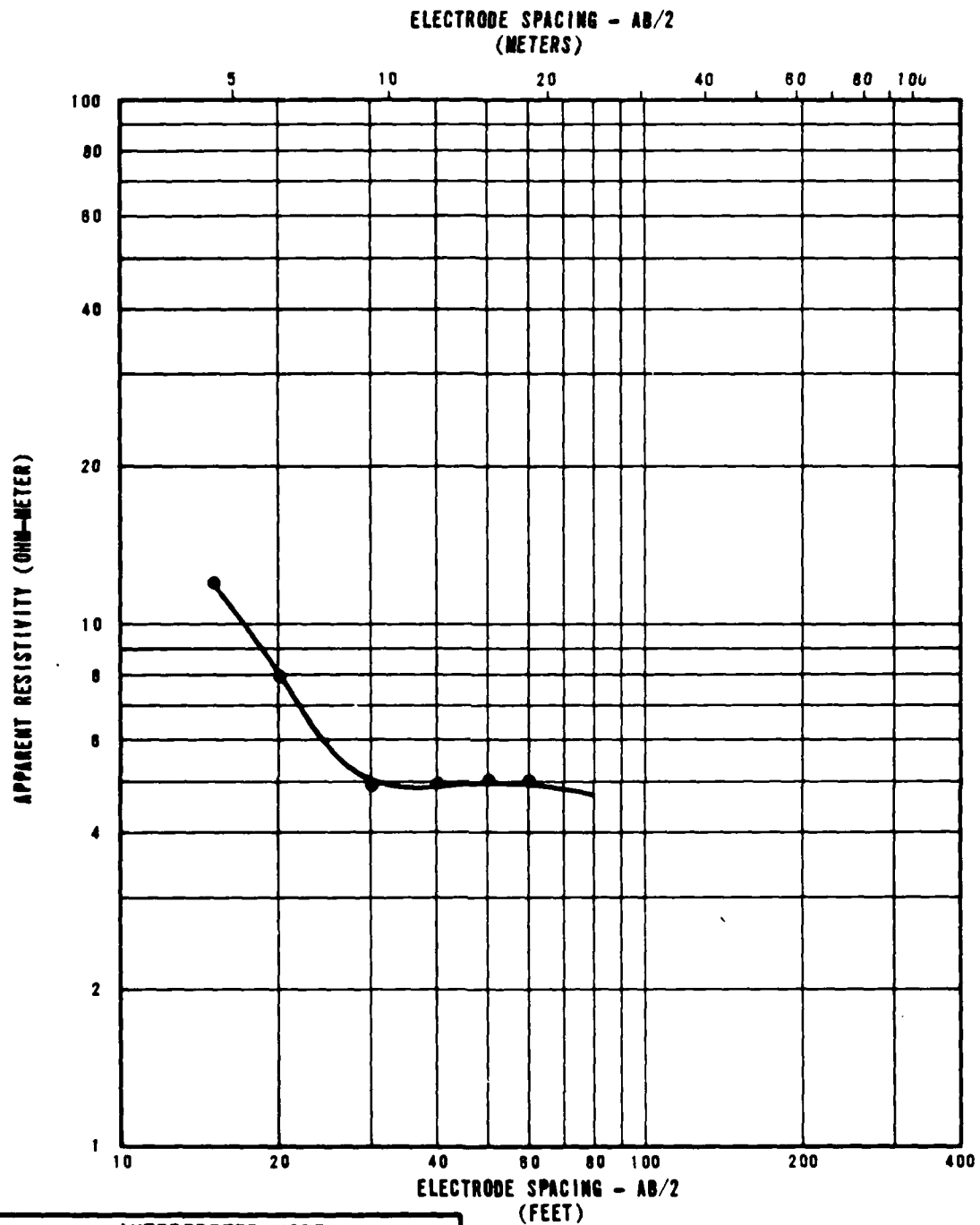
FIGURE
II-4-11

FUSCO NATIONAL INC.

24 MAR 81

USAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	11
9	3	4

**RESISTIVITY SOUNDING WA-R-12
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DDD

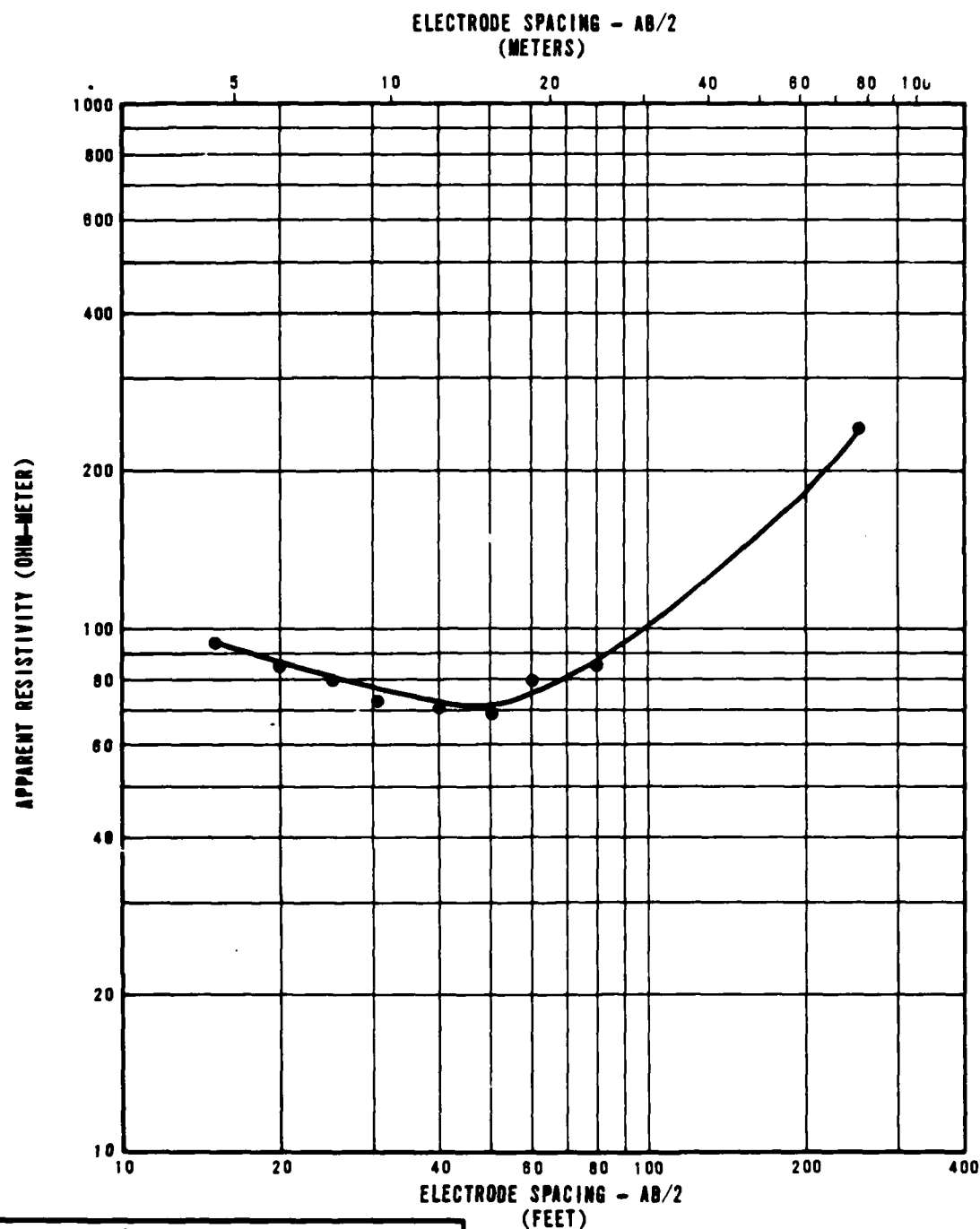
FIGURE
II-4-12

USRO NATIONAL INC.

24 MAR 81

DDAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	75
56	17	360
122	37	1450

RESISTIVITY SOUNDING WA-R-13
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

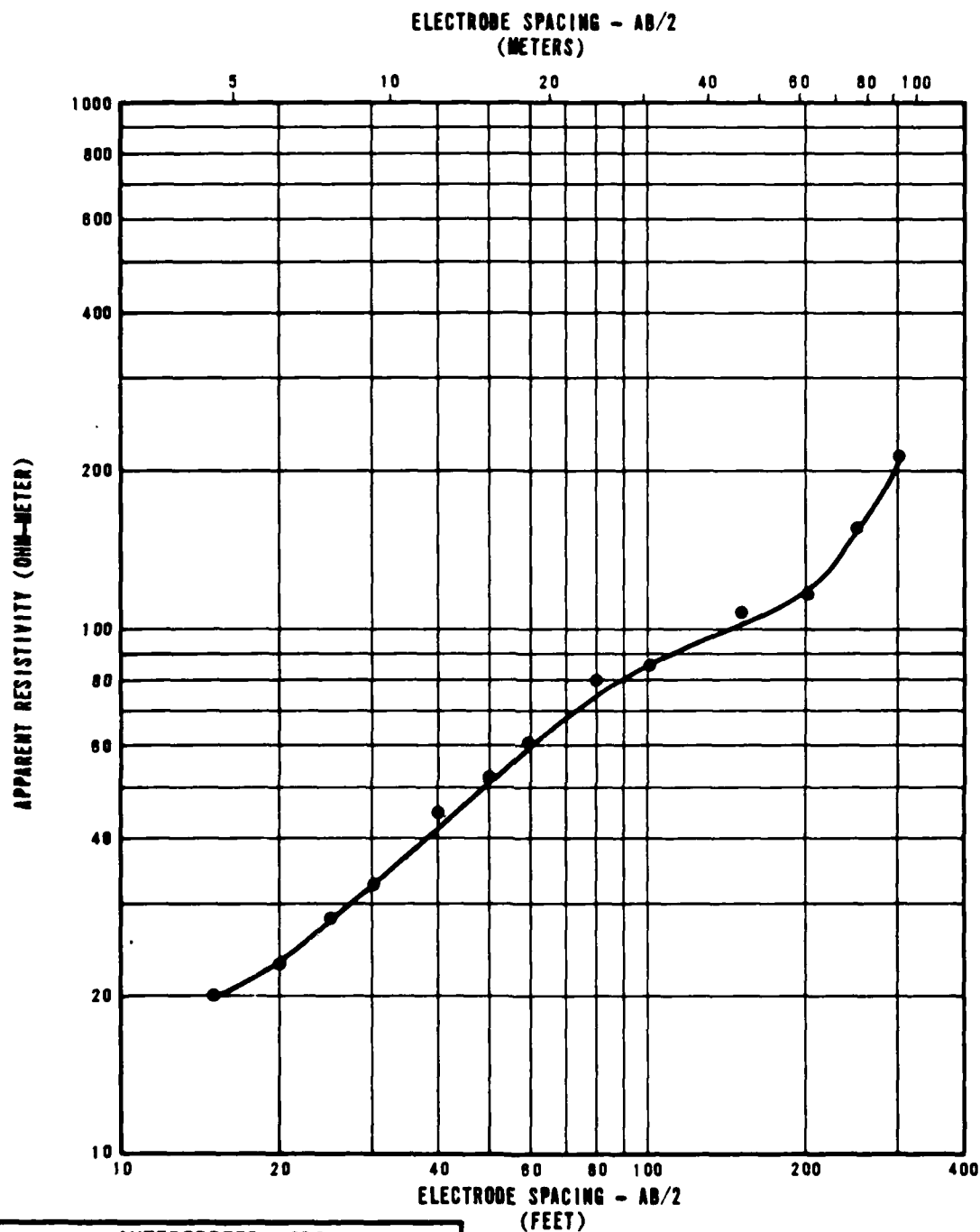
FIGURE
II-4-13

FUGRO NATIONAL, INC.

24 MAR 81

USAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	30
16	5	100
84	26	170

RESISTIVITY SOUNDING WA-R-14
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

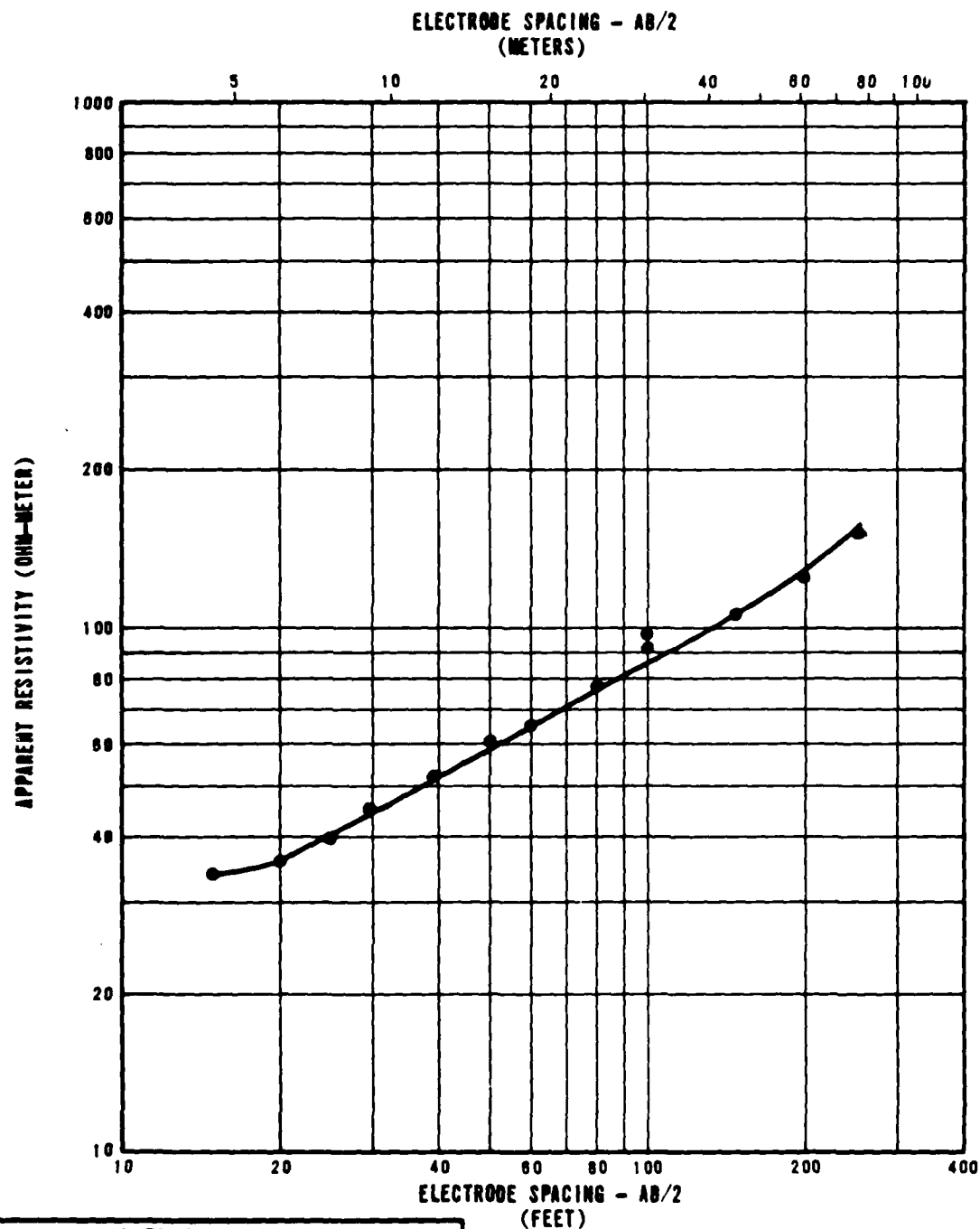
FIGURE
II-4-14

USRO NATIONAL INC.

24 MAR 81

USAF-15

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	15
14	4	140
54	16	75
74	23	160
133	41	1900

**RESISTIVITY SOUNDING WA-RB15
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

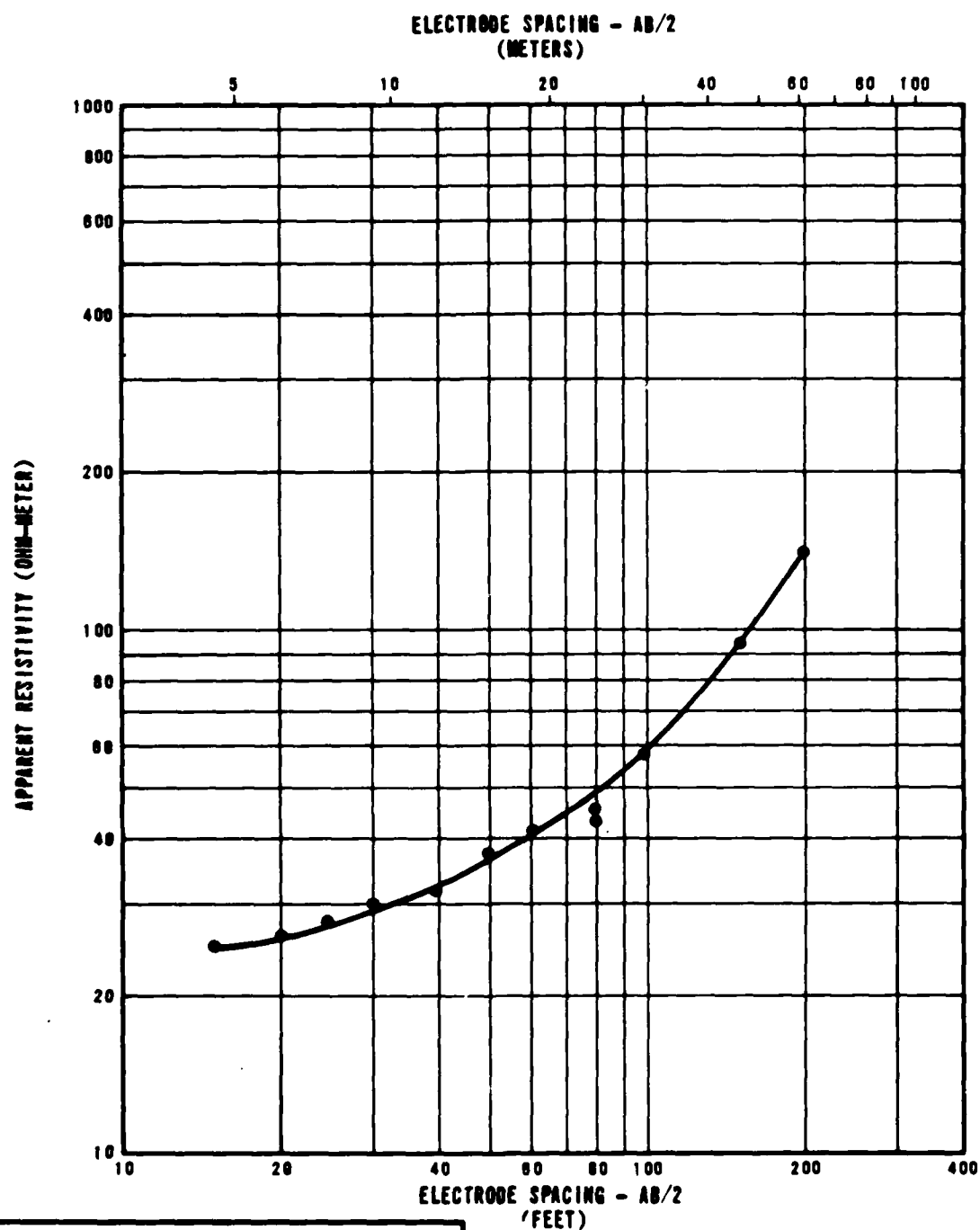
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-15

TURRO NATIONAL, INC.

24 MAR 81

USAF-15



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	25
24	7	100
85	26	2000

RESISTIVITY SOUNDING WA-R-16
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

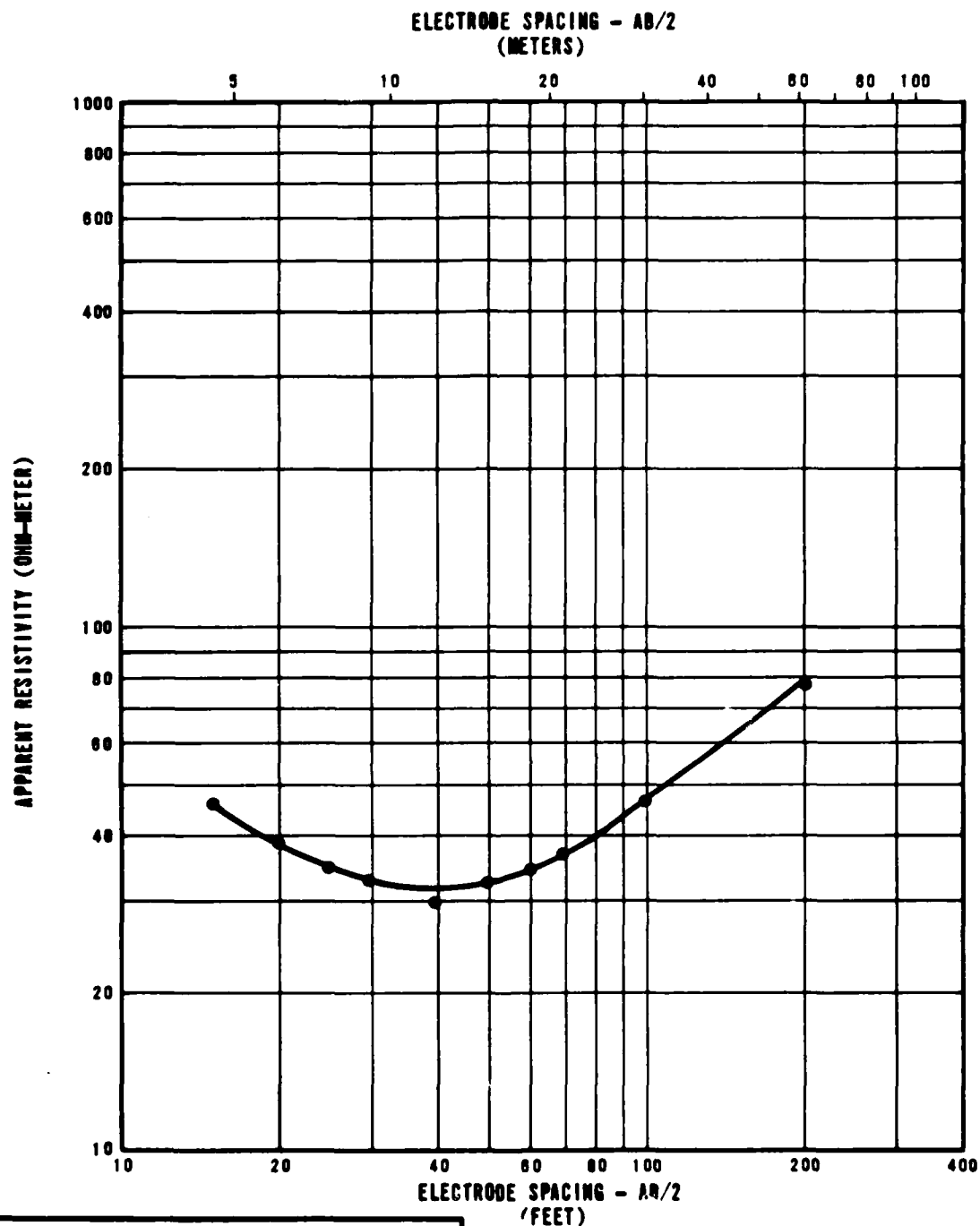
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

FIGURE
II-4-16

FUSCO NATIONAL, INC.

24 MAR 81

USAF-16



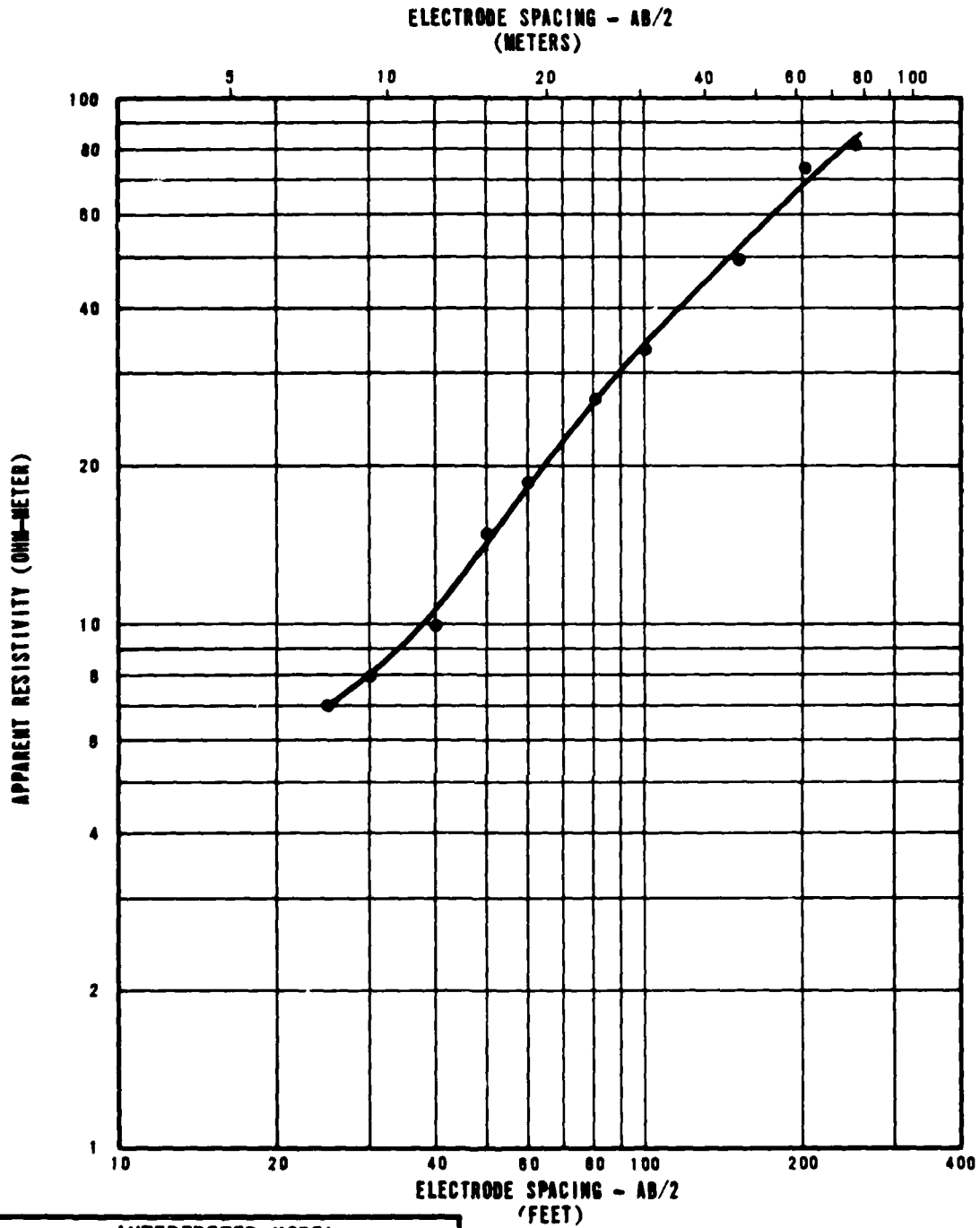
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	00
7	2	30
40	15	100

**RESISTIVITY SOUNDING WA-R:17
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-17

FUGRO NATIONAL INC.



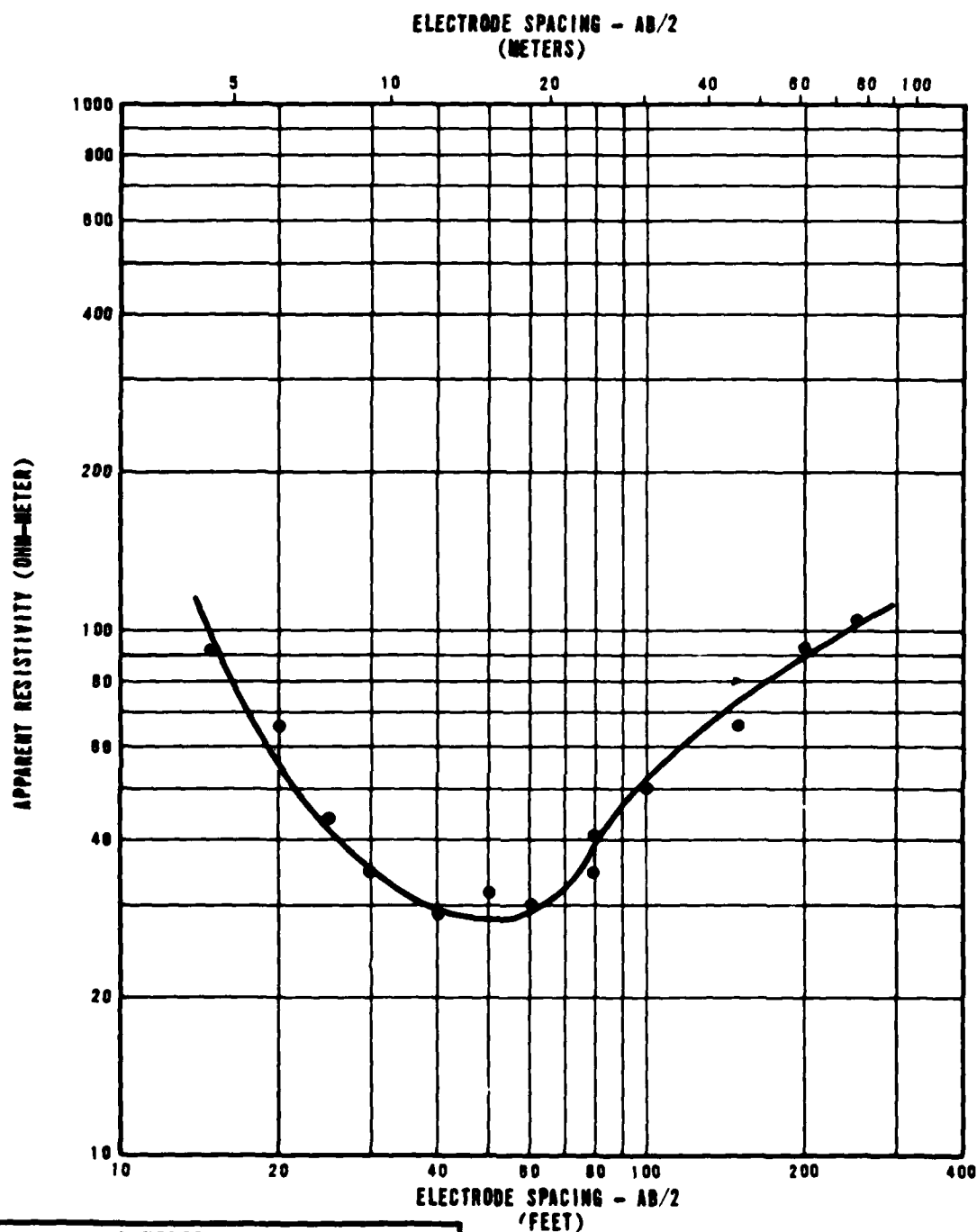
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	5
10	3	25
24	7	100
32	10	340

**RESISTIVITY SOUNDING WA-R-15
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-18

FURRO NATIONAL, INC.



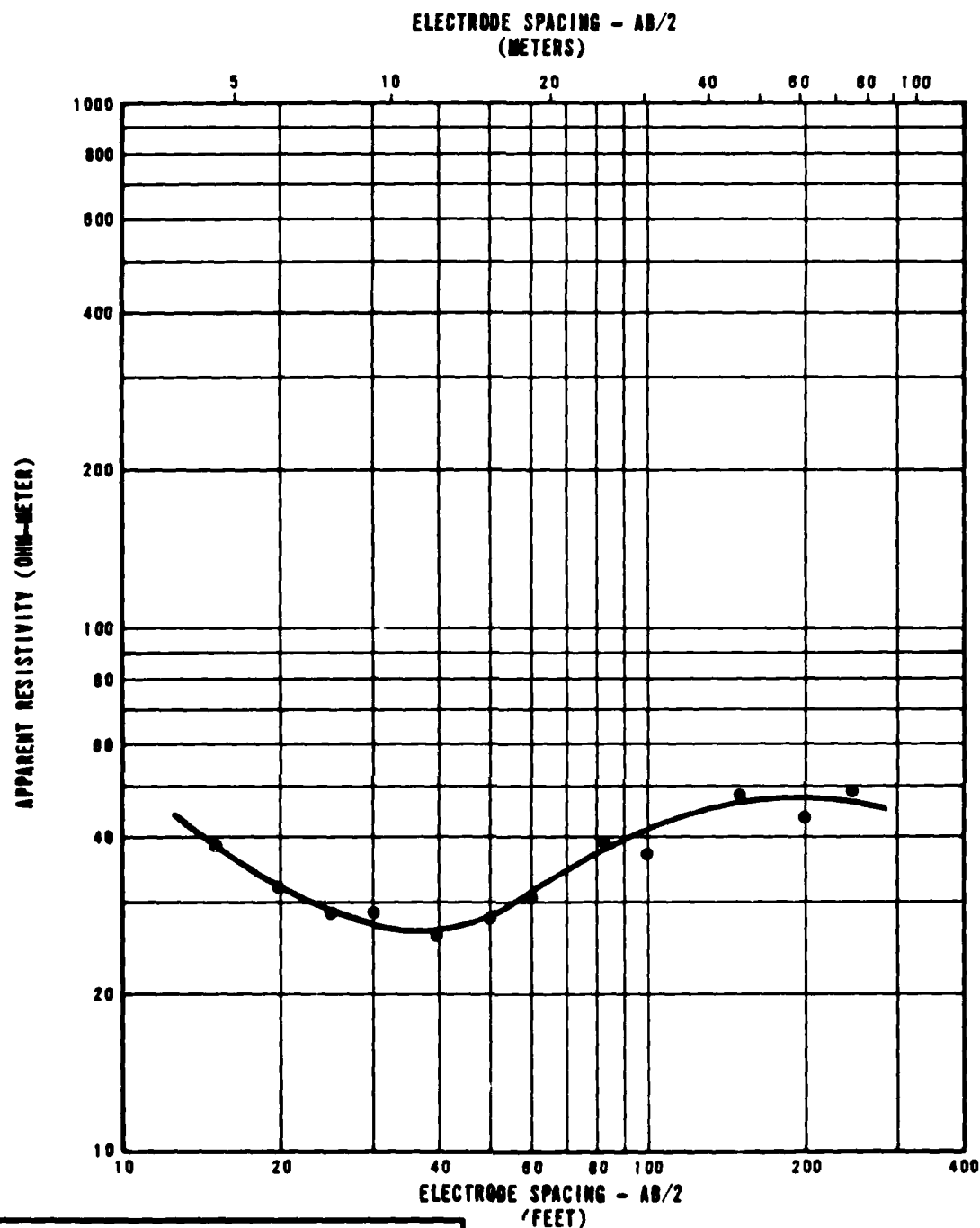
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	95
11	3	25
18	5	12
43	13	200

RESISTIVITY SOUNDING WA-R-20
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE 000

FIGURE
II-4-19

FUGRO NATIONAL, INC.



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	90
8	2	25
40	12	210
50	16	75
104	32	30

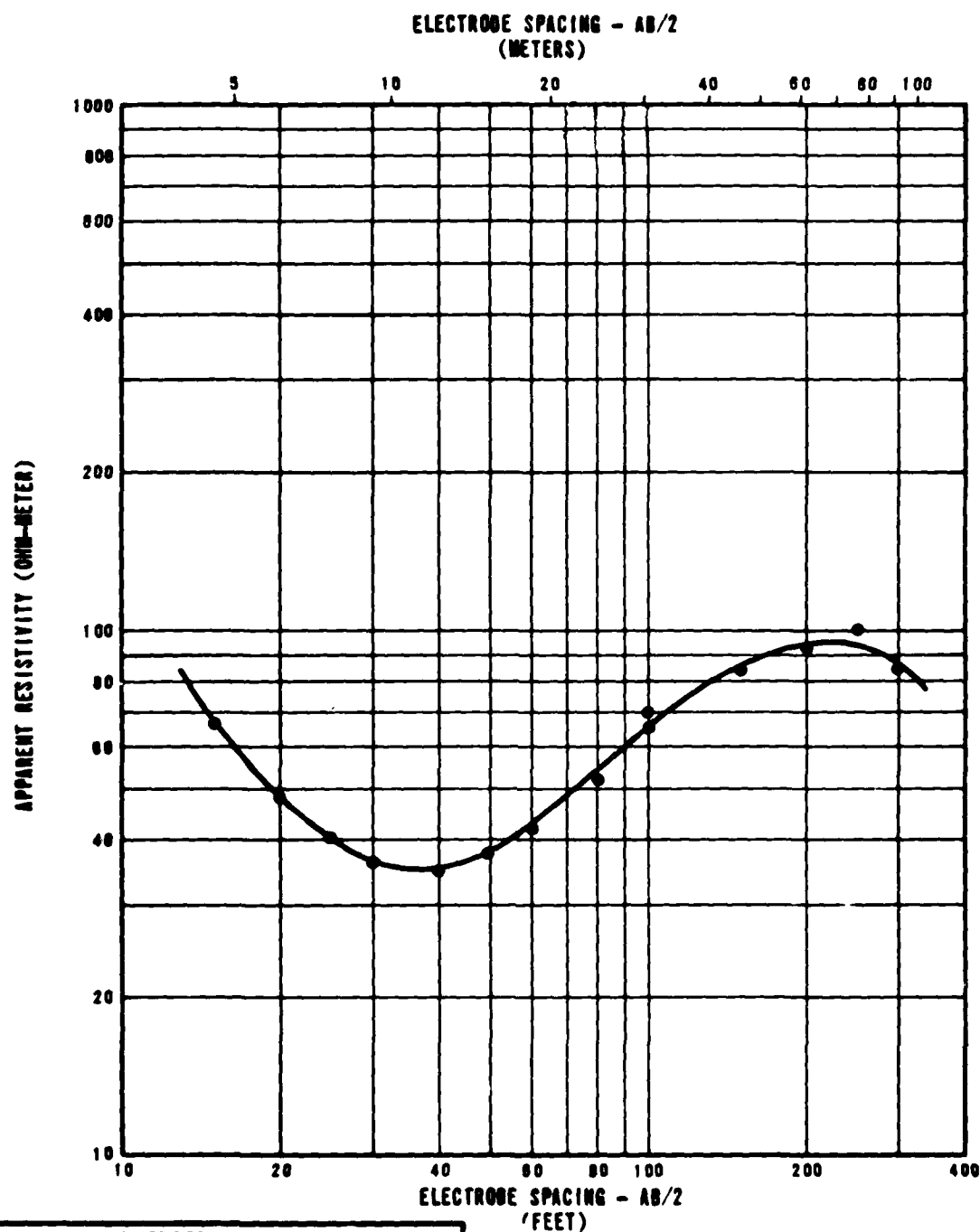
RESISTIVITY SOUNDING WA-R-20
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE 000

FIGURE
II-4-20

FUGRO NATIONAL INC.

FN-TR-27-WA-II



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	100
8	2	30
15	5	13
28	8	240
115	36	56

RESISTIVITY SOUNDING WA-R-27
SOUNDING CURVE AND INTERPRETATION
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-21

FUSCO NATIONAL, INC.

24 MAR 81

DDM F-18

5.0 BORING AND TRENCH LOGS

Explanation: All data from borings, trenches and test pits are presented on standard Fugro National logs in Sections 5.0 and 6.0. Explanations of the column headings on the logs are as follows:

- A. Designations - Borings, trenches, and test pits are identified as follows:

WA-B-1

WA - abbreviation for the site (e.g., WA-Wah Wah)

B - abbreviation for activity (e.g., B-boring, T-trench)
P-test pit)

1 - number of activity

- B. Sample Type - Different sampling techniques were used and the symbols are explained at the bottom of the boring logs. For details of sampling techniques, see Section A5.0 of Appendix A in Volume I. Horizontal lines, to scale, indicate the depth where sampling was attempted.

- C. Percent Recovery - The numbers shown represent the ratio (in percent) of the soil sample recovered in the sampler to the full penetration of the sampler.

- D. N Value - Corresponds to standard penetration resistance, which is number of blows required to drive a standard split-spoon sampler for the second and third of three 6-inch (15-cm) increments with a 140-pound (63.5-kg) hammer falling 30 inches (76 cm) (ASTM D 1586-67).

- E. Depth - Corresponds to depth below ground surface in meters and feet.

- F. Lithology - Graphic representation of the soil and rock types.
- G. USCS - Unified Soil Classification System (see Table II-5-1 for complete details) symbols.
- H. Soil Description - Except in cases where samples were classified based on laboratory test data, the descriptions are based on visual classification. The procedures outlined in ASTM D 2487-69, Classification of Soils for Engineering Purposes, and D 2488-69, Description of Soils (Visual-Manual Procedure) were followed. Solid lines across the column indicate known change in strata at the depth shown.

Definitions of some of the terms and criteria to describe soils and conditions encountered during the exploration follow.

Gradation : A coarse-grained soil is well-graded if it has a wide range in grain size and substantial amounts of most intermediate particle sizes.

Poorly graded indicates that the soil consists predominantly of one size (uniformly graded) or has a wide range of sizes with some intermediate sizes obviously missing (gap-graded).

Moisture :	Dry	- no feel of moisture
	Slightly Moist	- much less than normal moisture
	Moist	- normal moisture for soil
	Very Moist	- much greater than normal moisture
	Wet	- for soils below the water table

Consistency: Consistency descriptions of coarse-grained soils (GW, GP, GM, GC, SW, SP, SM, SC) are as follows.

<u>Consistency</u>	<u>N Value</u> <u>(ASTM D 1586-67)</u>
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Consistency descriptions of fine-grained soils (ML, CL, MH, CH,) are as follows:

<u>Consistency</u>	<u>Shear Strength</u> <u>(ksf) (kN/m²)</u>		<u>Field Guide</u>
Very Soft	0.25	12	Sample with height equal to twice the diameter, sags under own weight
Soft	0.25- 0.50	12 - 24	Can be squeezed between thumb and forefinger
Firm	0.50- 1.00	24- 48	Can be molded easily with fingers
Stiff	1.00- 2.00	48- 96	Can be imprinted with slight pressure from fingers
Very Stiff	2.00- 4.00	96- 192	Can be imprinted with considerable pressure from fingers
Hard	over 4.00	over 192	Cannot be imprinted by fingers

Grain Shape: Angular - particles have sharp edges and relatively plane sides with unpolished surfaces.

Subangular - particles are similar to angular but have somewhat rounded edges.

Subrounded - particles exhibit nearly plane sides but have well-rounded corners and edges.

Rounded - particles have smoothly curved sides and no edges.

Calcareous : Containing calcium carbonate; presence of calcium carbonate is commonly identified on the basis of reaction with dilute hydrochloric acid.

Caliche : Soils cemented by calcium carbonate and/or other soluble minerals by upward-moving solutions.

Degree of
Cementation: (Stages of development of caliche profile)

Stage	Gravelly Soils	Nongravelly Soils
I	Thin, discontinuous pebble coatings	Few filaments or faint coatings
II	Continuous pebble coatings, some interpebble fillings	Few to abundant nodules, flakes, filaments
III	Many interpebble fillings	Many nodules and internodular fillings
IV	Laminar horizon overlying plugged horizon	Increasing carbonate impregnation

Secondary
Material : Example - Sand with trace to some silt

Occasional - 0-4% (by dry weight - for cobbles and boulders)
Trace - 5-12% (by dry weight)
Little - 13-20% (by dry weight)
Some - >20% (by dry weight)

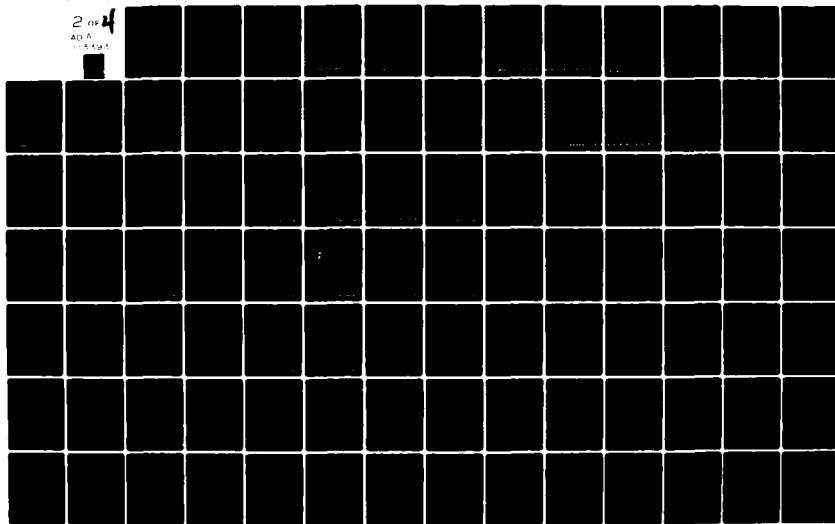
AD-A113 393

FUGRO NATIONAL INC LONG BEACH CA
VERIFICATION STUDY - WAH WAH VALLEY, UTAH. VOLUME II. GEOTECHNI--ETC(U)
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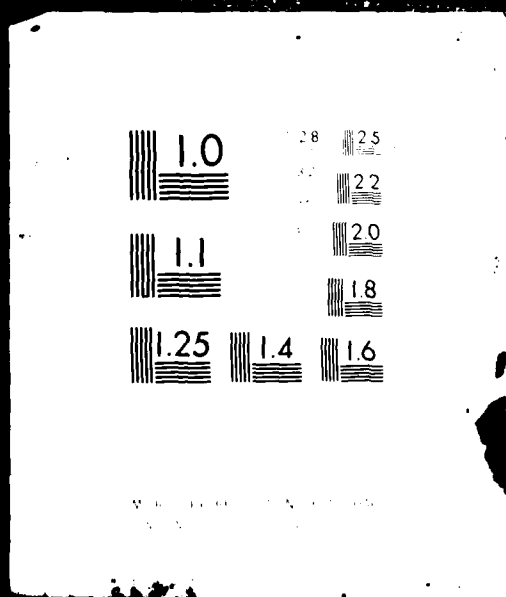
2 OF 4
AD A
105 505



2 OF 4

AD A

113393



Plasticity : Plasticity index is the range of water content, expressed as a percentage of the weight of the oven-dried soil, through which the soil is plastic. It is defined as the liquid limit minus the plastic limit. Descriptive ranges used on the logs include:

Nonplastic	(PI, 0 - 4)
Slightly Plastic	(PI, 4 - 15)
Medium Plastic	(PI, 15 - 30)
Highly Plastic	(PI, >30)

Cobbles and Boulders : A cobble is a rock fragment, usually rounded by weathering or abrasion, with an average diameter ranging between 3 and 12 inches (8 and 30 cm).

A boulder is a rock fragment, usually rounded by weathering or abrasion, with an average diameter of 12 inches (30 cm) or more.

- I. Remarks - This column was provided on boring and trench logs for comments regarding drilling difficulty, number and size of cobbles or boulders encountered, loss of drilling fluid in the boring, trench wall stability, and other conditions encountered during drilling and excavations.
- J. Dry Density and Moisture Content - The boring logs include a graphical display of laboratory test results for dry density (ASTM D 2937-71) in pounds per cubic foot and kilograms per cubic meter and moisture content (ASTM D 2216-71) in percent from representative samples taken during drilling. The symbols are explained at the bottom of the boring logs.

K. Sieve Analysis - The numbers represent the percentage by dry weight (ASTM D 422-63) of each of the following soil components:

GR - Gravel, rock particles that will pass a 3-inch (76-mm) sieve and are retained on No. 4 (4.75 mm) sieve.

SA - Sand, soil particles passing No. 4 sieve and retained on No. 200 (0.075 mm) sieve.

FI - Fines, silt or clay, soil particles passing No. 200 sieve.

L. Atterberg Limits (LL and PI) -

LL - Liquid Limit, the water content corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil (ASTM D 423-66).

PL - Plastic Limit, the water content corresponding to an arbitrary limit between the plastic and the semisolid state of consistency of a soil (ASTM D 424-59).

PI - Plasticity Index, numerical difference between the liquid limit (LL) and the plastic limit (PL) indicating the range of moisture content within which a soil-water mixture is plastic.

NP - Nonplastic.

M. Miscellaneous Information -

Elevations - indicated elevations on the logs are estimated from topographic maps of the study area, within an accuracy of half the contour interval.

Surficial
Geologic Unit - indicates the surficial geologic unit in which the activity is located.

Date Drilled - indicates the period from beginning to completion of the activity.

Drilling
Method - signifies the type of drilling procedure used such as rotary wash.

Hole Diameter - nominal size of boring drilled.

Water Level - indicates depth from ground surface to water table where encountered.

Trench Length - length at ground surface of final trench excavation.

Trench
Orientation - bearing of longitudinal trench centerline.

24 MAR 81

12

-18

-21

-24

-27

-30

-33

-36

-39

-42

100

100

100

100

100

100

100

100

60

70

80

90

100

110

120

130

140



CH

SM

CH

SC

GC

SC

SP
SM

SANDY CLAY, gray, very stiff, medium plastic, calcareous; some fine subrounded to rounded sand; gravelly sand (70.5' - 73.0').

CLAYEY SAND, gray, fine to coarse, poorly graded, very dense, subrounded to rounded, calcareous; some slightly plastic clay; trace fine gravel; sandy gravel (84.0' - 98.0').

GRAVELLY SAND, brown, fine to coarse, poorly graded, very dense, subrounded to rounded, calcareous; little to some fine gravel; trace to little silt.

loss of drilling fluid



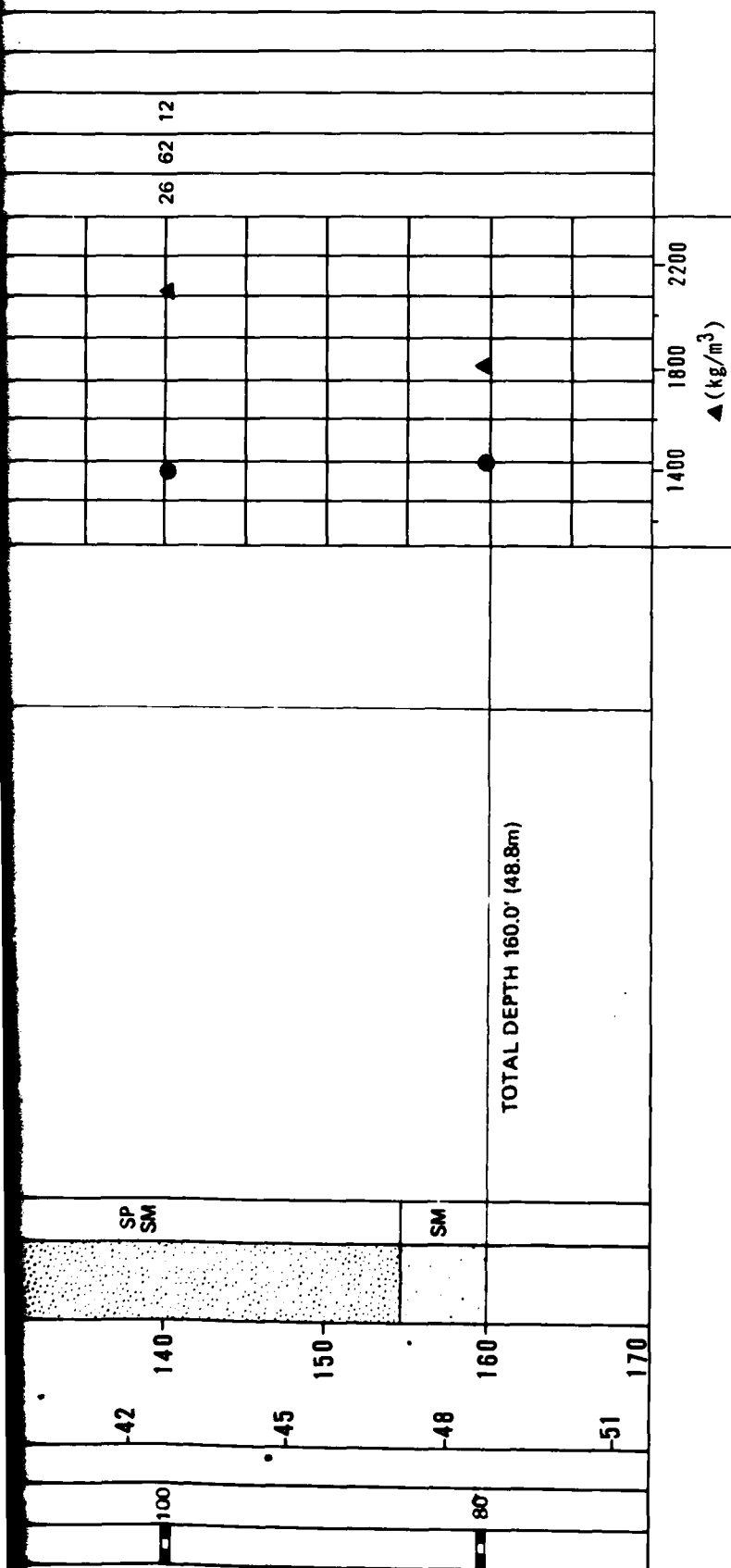
0 21 79 57 30
31 58 13

10 53 37 25 11

43 34 23 48 29

1 73 26

26 62 12



EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

† - TEST LOCATION APPROXIMATELY 5 FEET FROM BORING.

BORING DETAILS

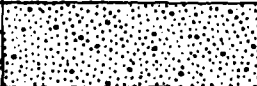
ELEVATION : 4810' (1466m)
 SURFICIAL GEOLOGIC UNIT : A5i/A4o
 DATE DRILLED : 30 June 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

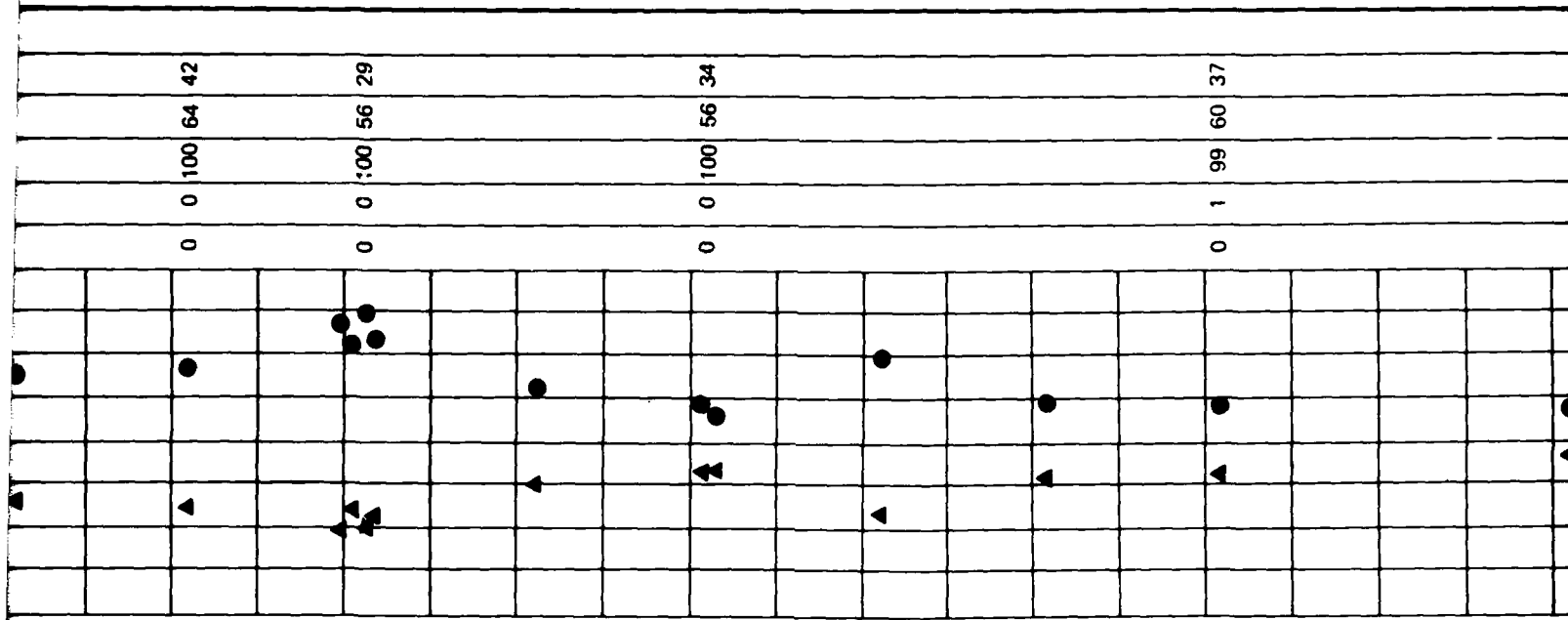
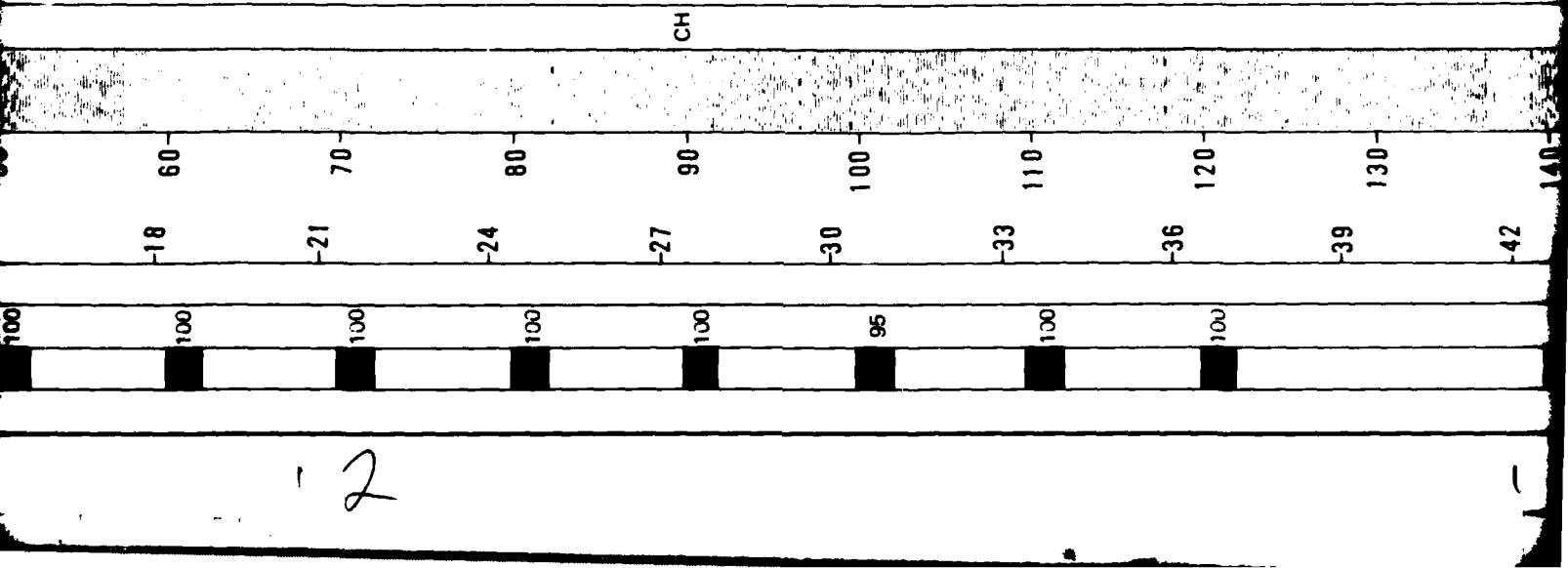
LOG OF BORING WA-B-1
 WAH WAH VALLEY, UTAH

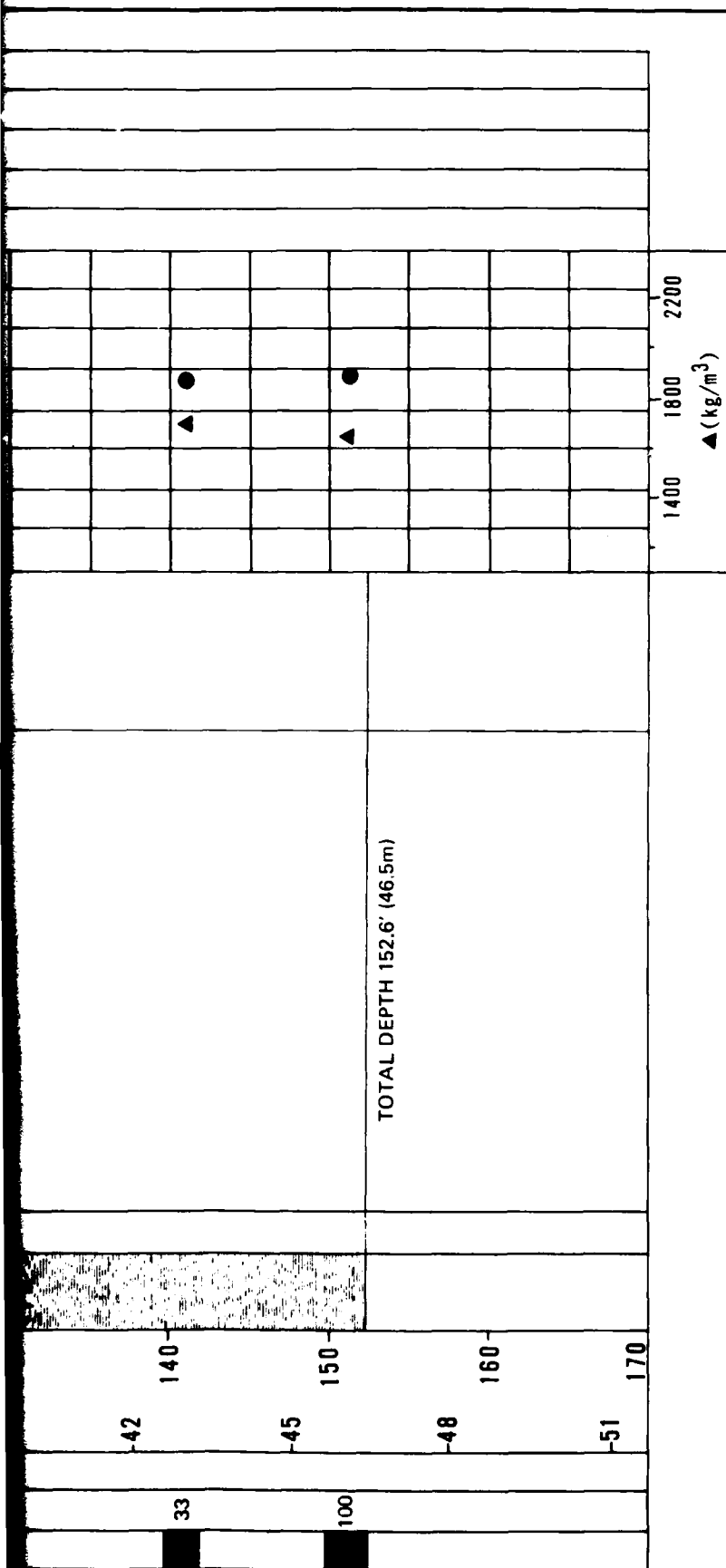
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-5-1

FUGRO NATIONAL, INC.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)													SIEVE ANALYSIS			
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI					
	72	12	0	0		ML	SANDY SILT, gray, hard, slightly plastic, calcareous; some fine subrounded to rounded sand. CLAYEY SILT, gray, hard, medium plastic, calcareous; trace fine sand.	Continuous SPT (0.0' - 10.5') sample intervals not shown	▲	●							0	25	75	32	5				
	100	6				MH			▲	▲	●							0	8	92	57	19			
	100	15							▲									0	4	96	47	17			
	100	19	3	10		ML					▲	●													
	100	21					GRAVELLY SAND, brown, fine to coarse, well graded, very dense, subrounded to rounded; some fine gravel; trace silt.										45	46	9						
	100	22	6	20		SW-SM																			
	100		9	30					▲	▲	●	●						0	0	100	64	42			
	100		12	40					▲			●													
	100		15	50			CLAY, gray, very stiff to hard, medium to highly plastic, calcareous.			▲	●														
	100		18	60					▲		●							0	0	100	64	42			
	100																								
	100		21	70					▲		●														





EXPLANATION

-  FUGRO DRIVE SAMPLE
 BULK SAMPLE
 PITCHER TUBE SAMPLE
 STANDARD PENETRATION TEST SAMPLE
 CORE SAMPLE
 N - STANDARD PENETRATION RESISTANCE
 ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
 ● - MOISTURE CONTENT (ASTM: D-2216-71)
 NR - NO RECOVERY

BORING DETAILS

- ELEVATION : 4650' (1417m)
SURFICIAL GEOLOGIC UNIT : A5y/A4o
DATE DRILLED : 1 July 1980
DRILLING METHOD : Rotary Wash
HOLE DIAMETER : 4 7/8" (124mm)
WATER LEVEL : Not Encountered

LOG OF BORING WA-B-2
WAH WAH VALLEY, UTAH

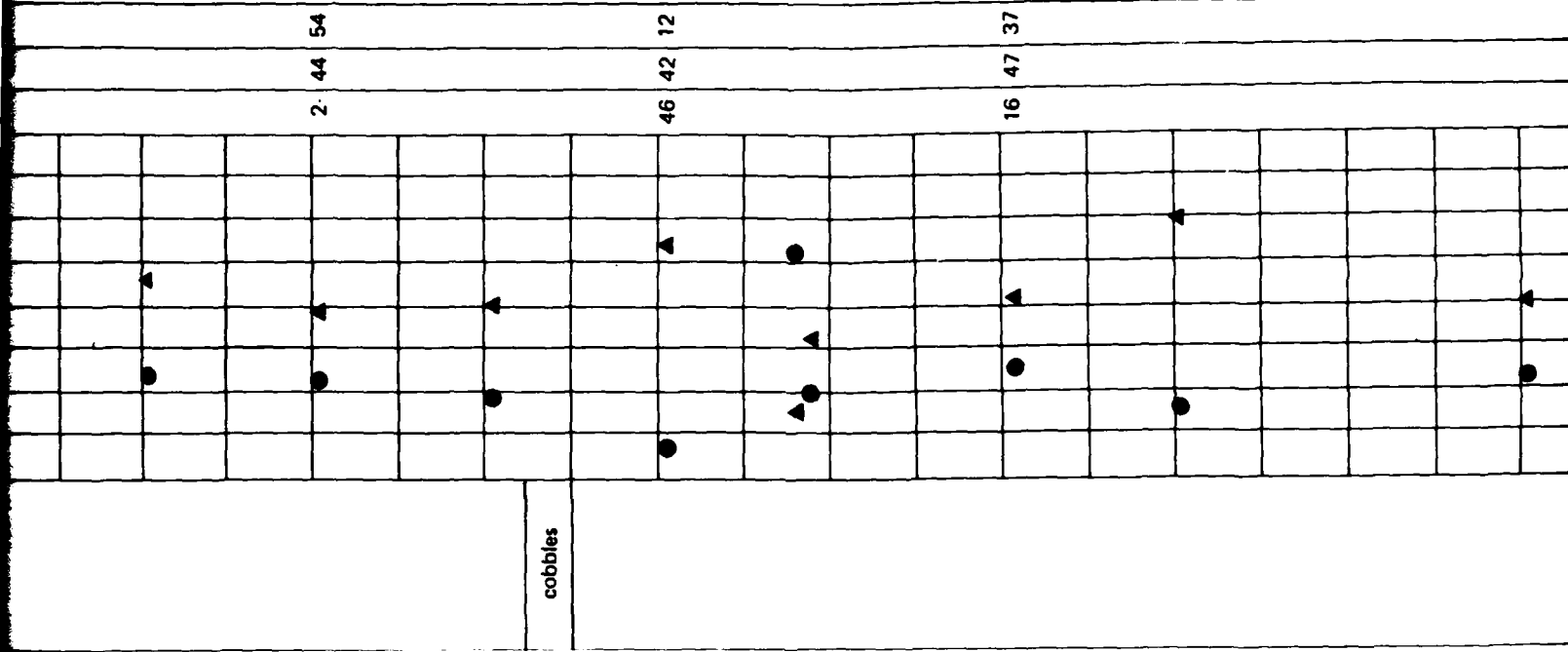
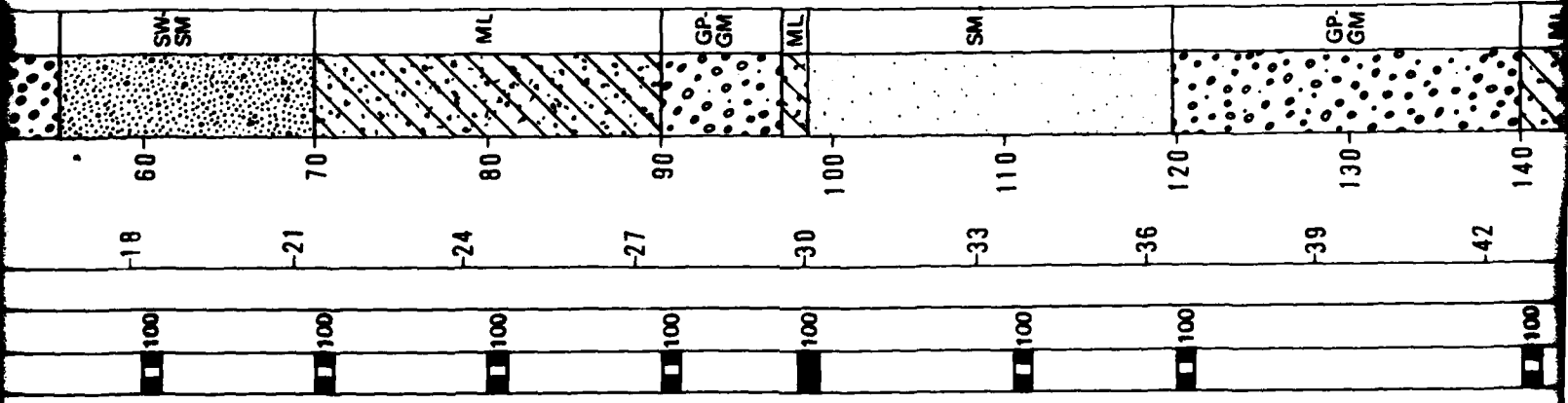
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

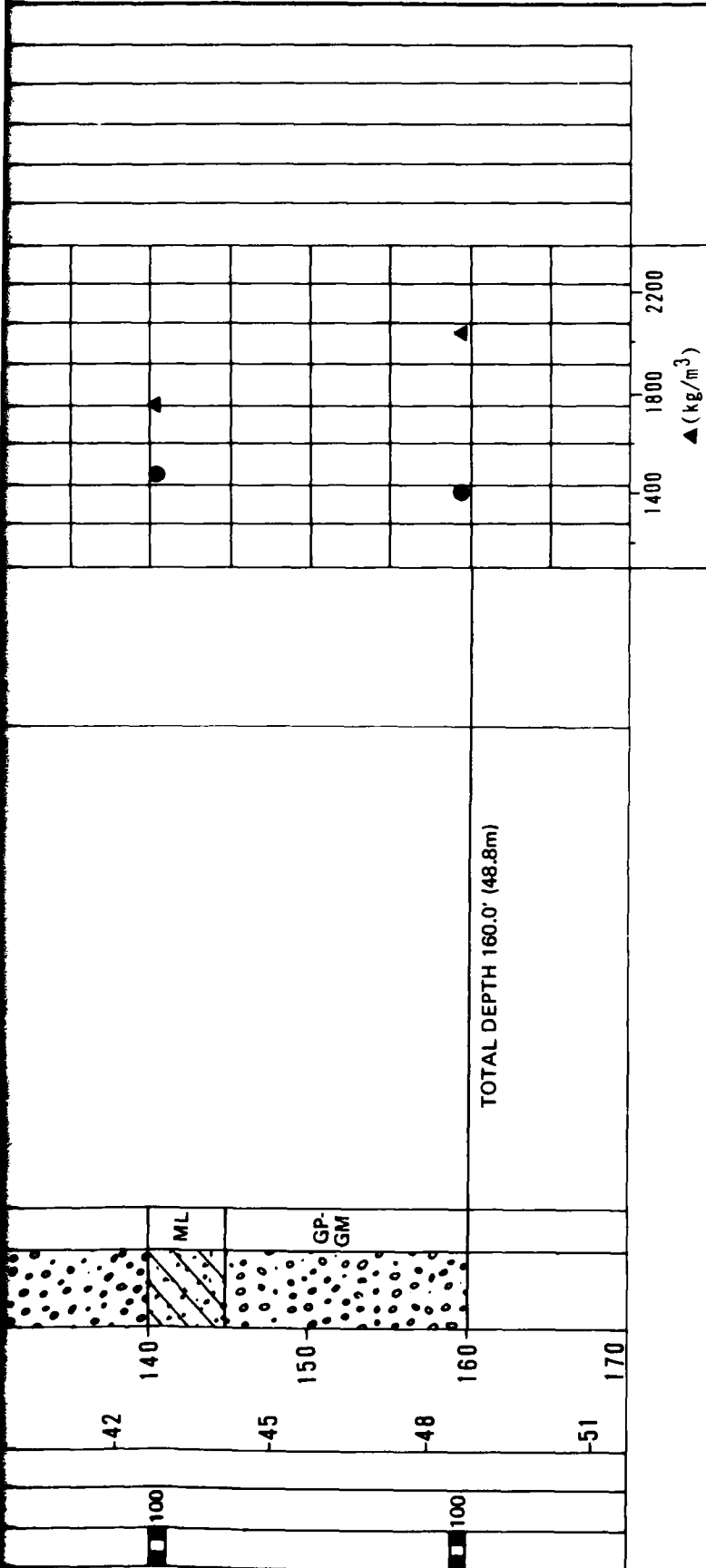
FIGURE
II-5-2

FUGRO NATIONAL, INC.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)														SIEVE ANALYSIS			
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI						
1	73	8	0	0	SM	SM	Interbedded layers of GRAVEL, SAND, and FINES:	Continuous SPT (0.0' - 6.0') sample intervals not shown	●								12	62	26							
2	80	11					GRAVEL:		●	▲							19	53	28							
3	41	58	3	10	SP-SM	SP-SM	SANDY GRAVEL (GP-GM): light brown to gray, fine to coarse, poorly graded, very dense, subrounded to rounded, calcareous; some fine to coarse sand; trace silt.		●				▲				42	50	8							
4	100				GP-GM	GP-GM	SAND:		●																	
5	100		6	20	SW-SM	SW-SM	GRAVELLY SAND (SW-SM, SP-SM): light brown to light gray, fine to coarse, poorly to well graded, very dense, subrounded to rounded, calcareous; some fine gravel; trace silt.	cobbles	●				▲				34	56	10							
6	100		9	30	SM	SM	SILTY SAND (SM): light brown to light gray, fine to coarse, poorly graded, loose to very dense, subrounded to rounded, calcareous; some nonplastic silt; trace to little fine gravel.		●								12	57	31							
7	100				SW-SM	SW-SM	FINES:		●																	
8	80		12	40	SM	SM	SANDY SILT (ML): brown, very stiff, nonplastic, calcareous; some fine to medium subrounded to rounded sand.		●	●							6	69	25							
9	80		15	50	GP-GM	GP-GM			●																	
10	100		18	60	SW-SM	SW-SM			●																	

12





EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

† - TEST LOCATION APPROXIMATELY 5 FEET FROM BORING

BORING DETAILS

ELEVATION : 4875' (1486m)
 SURFICIAL GEOLOGIC UNIT : A5y
 DATE DRILLED : 15 July 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

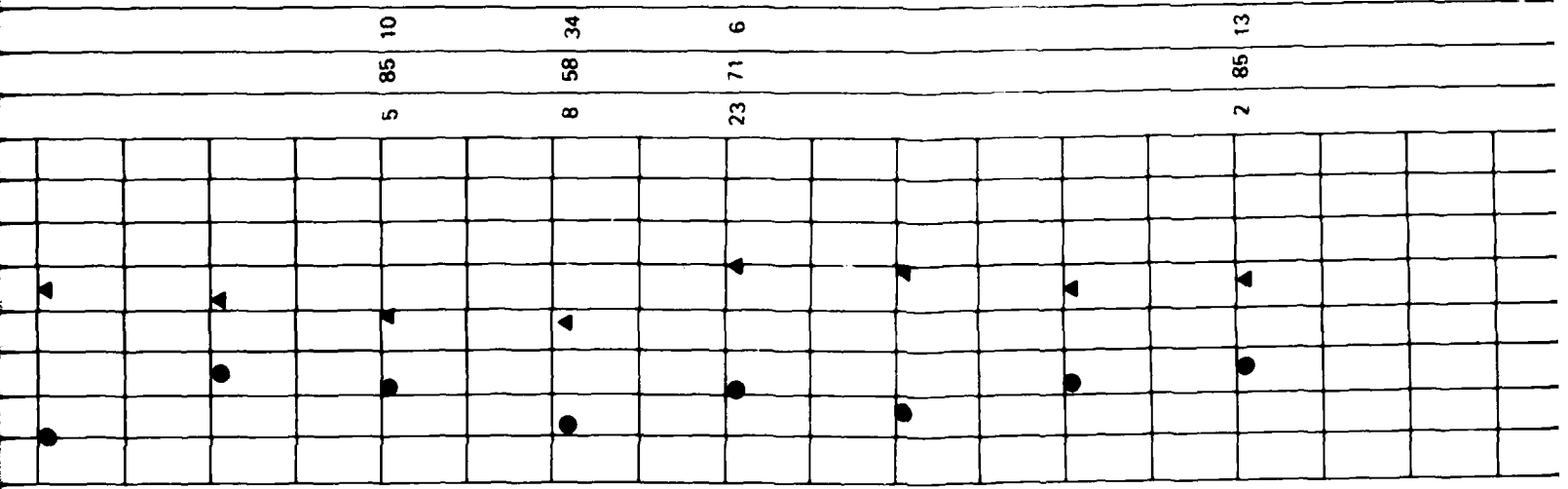
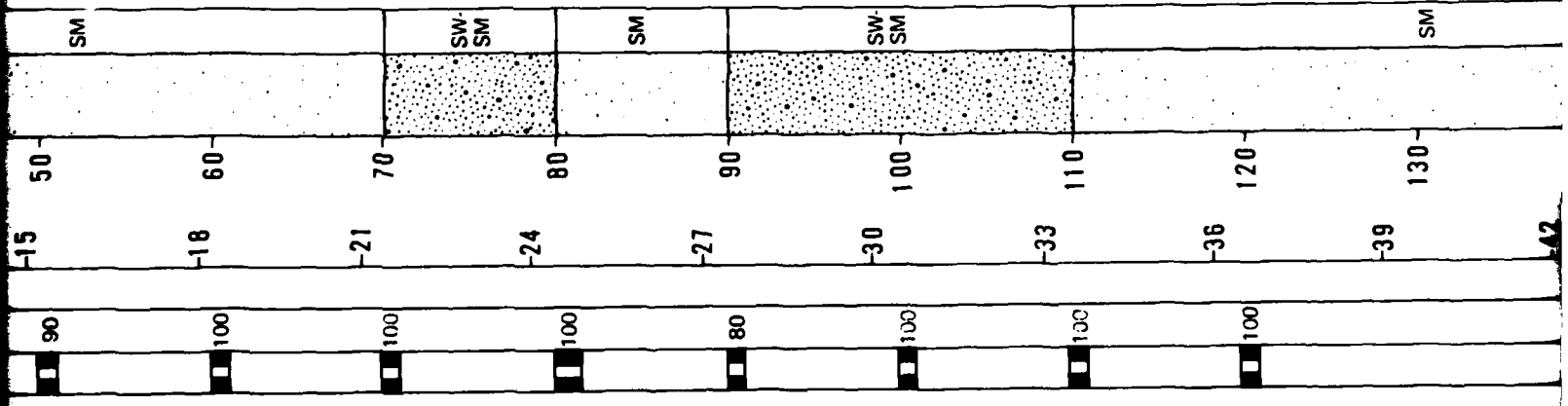
LOG OF BORING WA-B-3 WAH WAH VALLEY, UTAH

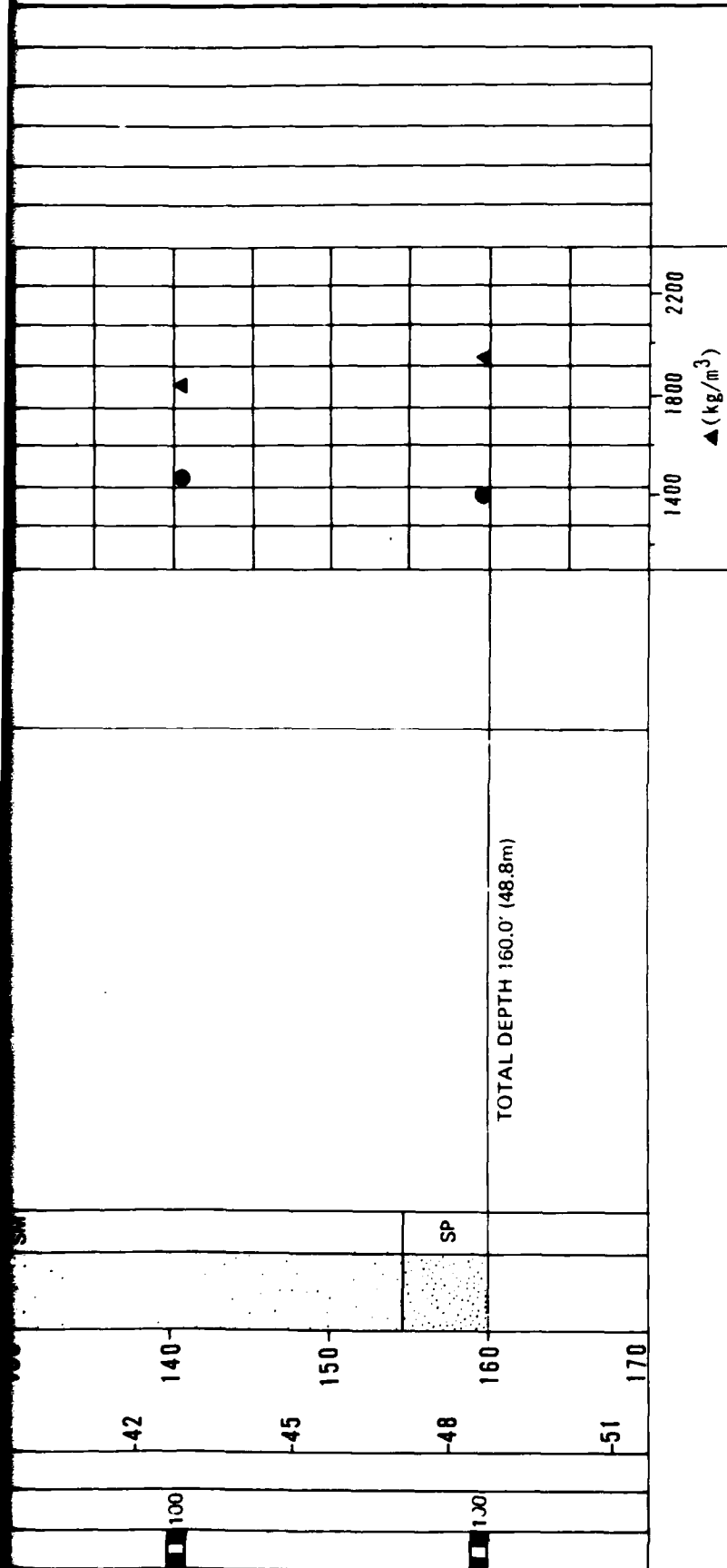
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-5-3

FUGRO NATIONAL, INC.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲ (pcf)													SIEVE ANALYSIS			
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI					
	85	12	0	0		SM	Interbedded layers of GRAVELLY SAND and SILTY SAND:	Continuous SPT (0.0' - 10.5') sample intervals not shown	●	▲							0	64	36						
	100	11				SM-SC	GRAVELLY SAND (SM-SC, SP, SW-SM, SM): light brown to red, fine to coarse, poorly to well graded, medium dense to very dense, subangular to subrounded, calcareous, little to some fine to coarse gravel; trace to little none to slightly plastic silt; sand (70.0' - 80.0').		●									20	61	19	23	5			
	90	14	3	10		SM			●					▲				45	51	4					
	80	33				SP	SILTY SANDY (SM): brown, fine to coarse, poorly graded, medium dense to very dense, subangular to subrounded, calcareous, little to some nonplastic silt, trace fine gravel, sandy silt (18.0' - 25.0').		●					▲											
	87		6	20		ML		cementation	●								0	44	56						
	93					SM			●					▲				2	74	24		NP			
	90		9	30		SW-SM			●																
	92		12	40					●					▲											
	100																37	48	15						
	90		15	50		SM			●																
														▲											
	100		18	60					●																
													▲												





EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

† - TEST LOCATION APPROXIMATELY 5 FEET FROM BORING

BORING DETAILS

ELEVATION : 5025' (1532m)
 SURFICIAL GEOLOGIC UNIT : A4o/A5y
 DATE DRILLED : 16 July 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

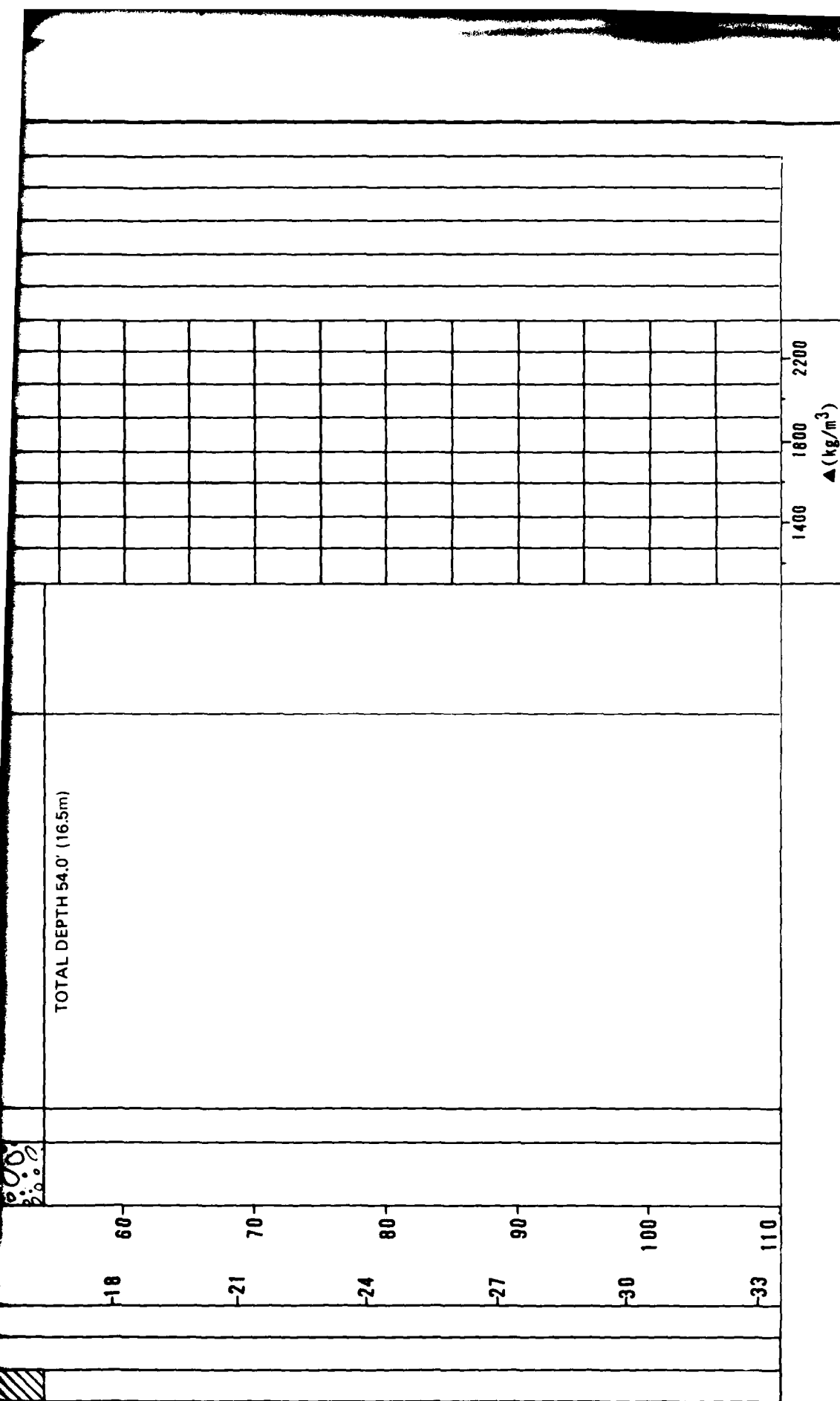
LOG OF BORING WA-B-4
 WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMD

FIGURE
 D-5-4

FUGRO NATIONAL, INC.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)												SIEVE ANALYSIS			
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI				
			0	0		SM	SILTY SAND, brown, fine to coarse, poorly graded, dense, subrounded to rounded, calcareous; some silt; some fine to coarse gravel.									24	50	26						
	80		3	10		SM	GRAVELLY SAND, brown, fine to coarse, poorly graded, dense, subangular to rounded, calcareous; little to some fine gravel, little nonplastic silt.									20	66	14						
	100		6	20		GW-GM	SANDY GRAVEL, brown, fine to coarse, poorly to well graded, very dense, subangular to subrounded, calcareous, some fine to coarse sand, trace silt, stage IV caliche (46.0' - 54.0').	cobbles and boulders								59	34	7						
	100		9	30		GP-GM																		
	100		12	40		GW																		
	100		15	50		GW																		
	100		18	60			TOTAL DEPTH 54.0' (16.5m)									64	35	1						



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

BORING DETAILS

ELEVATION : 5240' (1597m)
SURFICIAL GEOLOGIC UNIT : A5i
DATE DRILLED : 17 July 1980
DRILLING METHOD : Rotary Wash
HOLE DIAMETER : 4 7/8" (124mm)
WATER LEVEL : Not Encountered

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EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

† - TEST LOCATION APPROXIMATELY 5 FEET FROM BORING

BORING DETAILS

ELEVATION : 5240' (1597m)

SURFICIAL GEOLOGIC UNIT : A5i

DATE DRILLED : 17 July 1980

DRILLING METHOD : Rotary Wash

HOLE DIAMETER : 4 7/8" (124mm)

WATER LEVEL : Not Encountered

LOG OF BORING WA-B-5
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-5

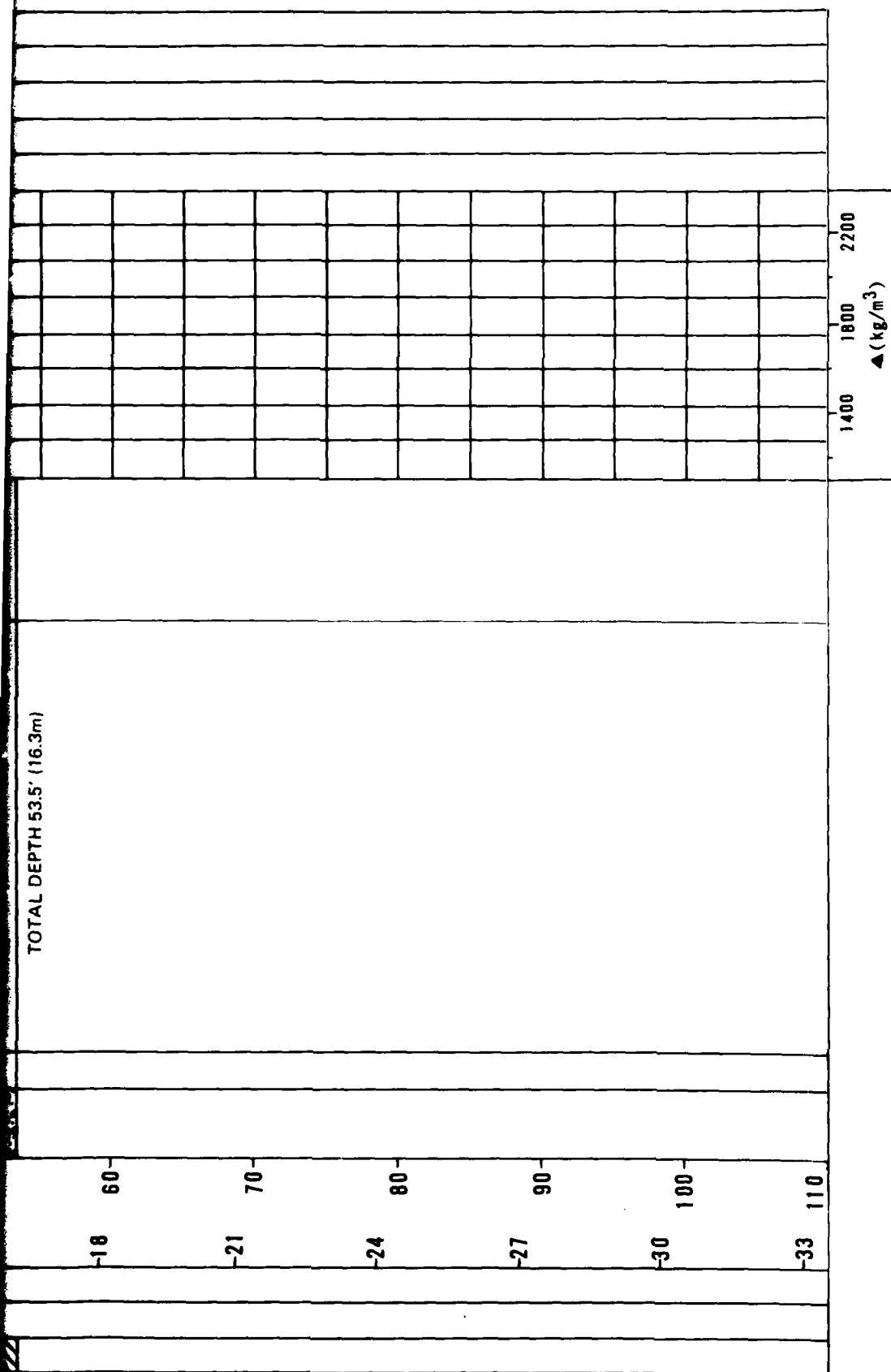
FUGRO NATIONAL, INC.

AFV-08

CHECKED BY _____ APPROVED BY _____

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH		LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)													SIEVE ANALYSIS				
			METERS	FEET					80	90	100	110	120	130	140	GR	SA	FI	LL	PI						
	50	0	0	0	SM	SM	SILTY SAND, light brown, fine to coarse, poorly graded, loose, subangular to subrounded, calcareous, little nonplastic silt.		●	▲							0	81	19							
	47	3	10		GP, GM	GP, GM	SANDY GRAVEL, brown, fine to coarse, poorly graded, loose, angular to subangular, calcareous; little fine to coarse sand, trace nonplastic silt.																			
	47	6	20		SM	SM	SILTY SAND, light brown to brown, fine to coarse, poorly graded, dense to very dense, subangular to subrounded, calcareous, little to some nonplastic silt, none to trace fine gravel.	cementation	●	▲							0	76	24							
																									NP	
	60	9	30				DACITE PORPHYRY, gray-black, porphyritic.	cementation	●	▲							6	68	26							
		12	40		Rock	Rock																				
		15	50																							
		18	60				TOTAL DEPTH 53.5' (16.3m)																			

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EXPLANATION

- ☒ FUGRO DRIVE SAMPLE
- ☐ BULK SAMPLE
- ☐ PITCHER TUBE SAMPLE
- ☐ STANDARD PENETRATION TEST SAMPLE
- ☒ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE

BORING DETAILS

- ELEVATION : 5020' (1530m)
- SURFICIAL GEOLOGIC UNIT : A4o/A5y
- DATE DRILLED : 8 October 1979
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : Not Encountered

LOG OF BORING
WAH WAH VALLEY

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE

FUGRO NATIONAL

ASTM: D-2937-71

EXPLANATION

 FUGRO DRIVE SAMPLE

 BULK SAMPLE

 PITCHER TUBE SAMPLE

 STANDARD PENETRATION TEST SAMPLE

 CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

† - TEST LOCATION APPROXIMATELY 5 FEET FROM BORING

BORING DETAILS

ELEVATION : 5020' (1530m)

SURFICIAL GEOLOGIC UNIT : A4o/A5y

DATE DRILLED : 8 October 1979

DRILLING METHOD : Rotary Wash

HOLE DIAMETER : 4 7/8" (124mm)

WATER LEVEL : Not Encountered

LOG OF BORING WA-B-6
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

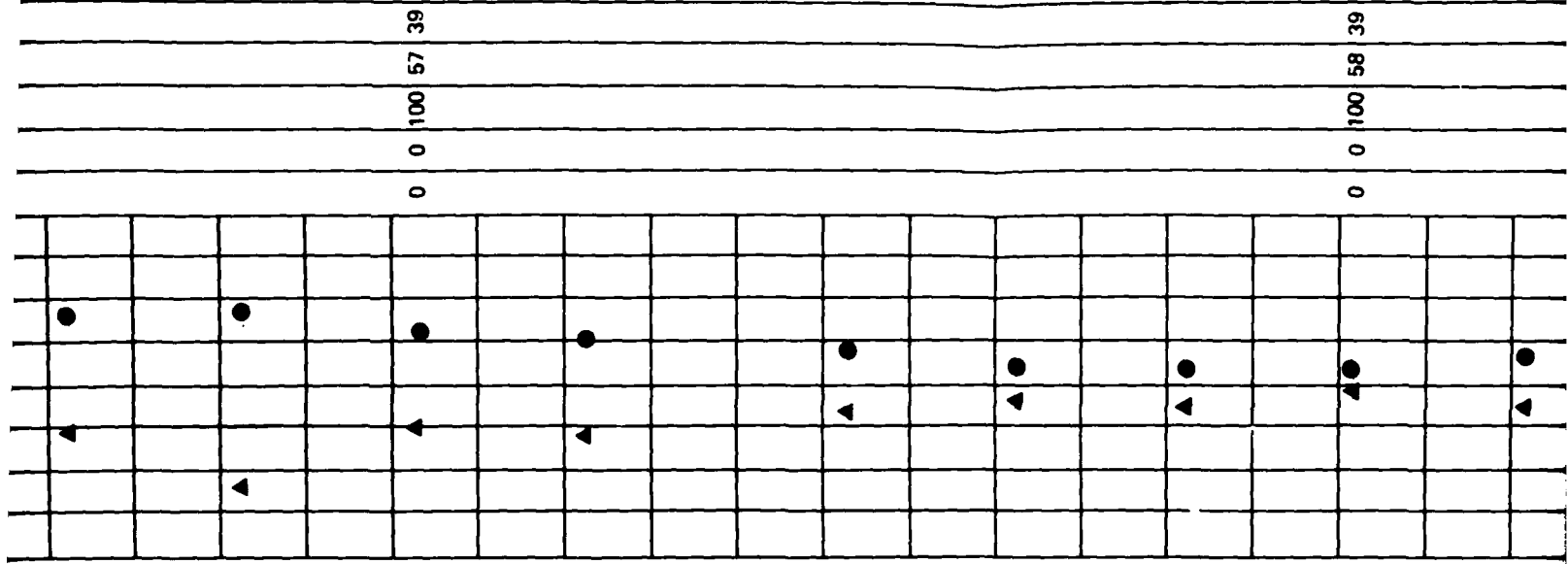
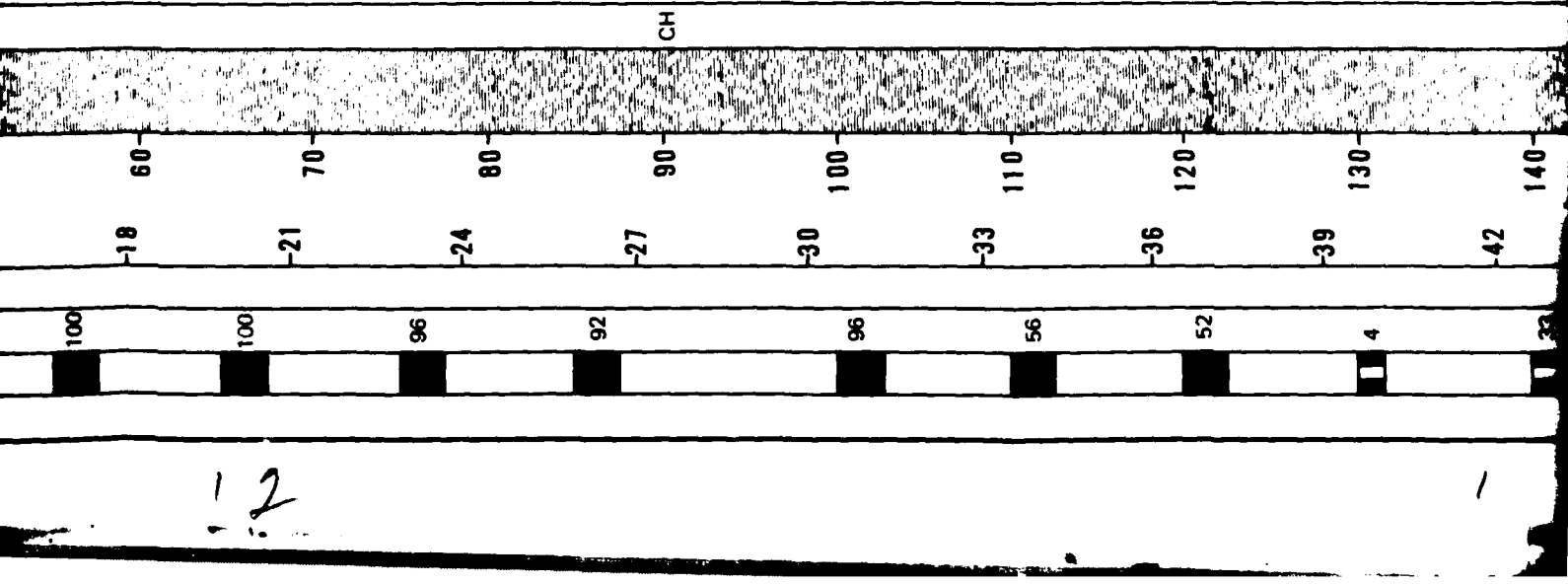
FIGURE
II-5-6

FUGRO NATIONAL, INC.

AFV-06

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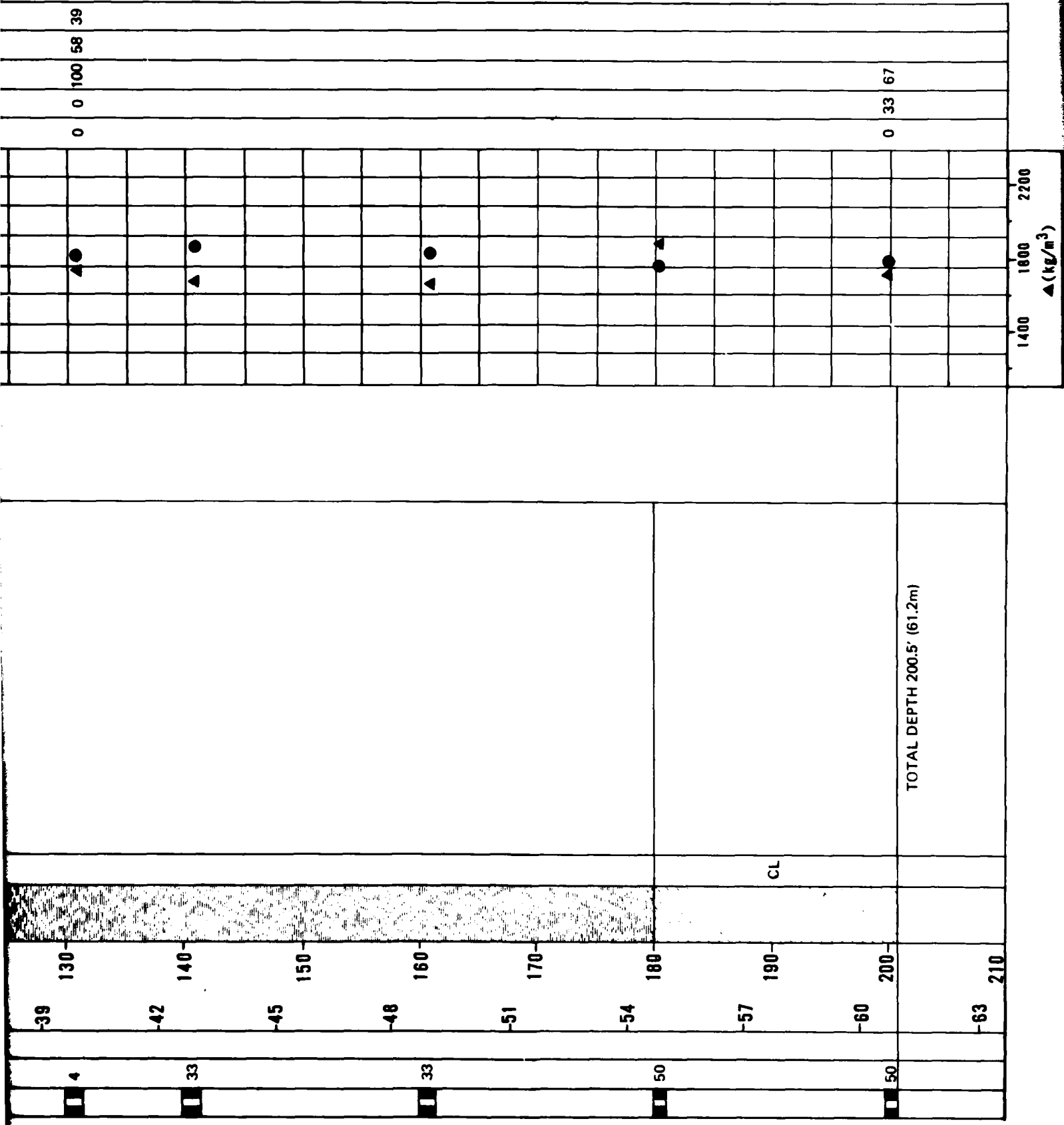
24 MAR 81

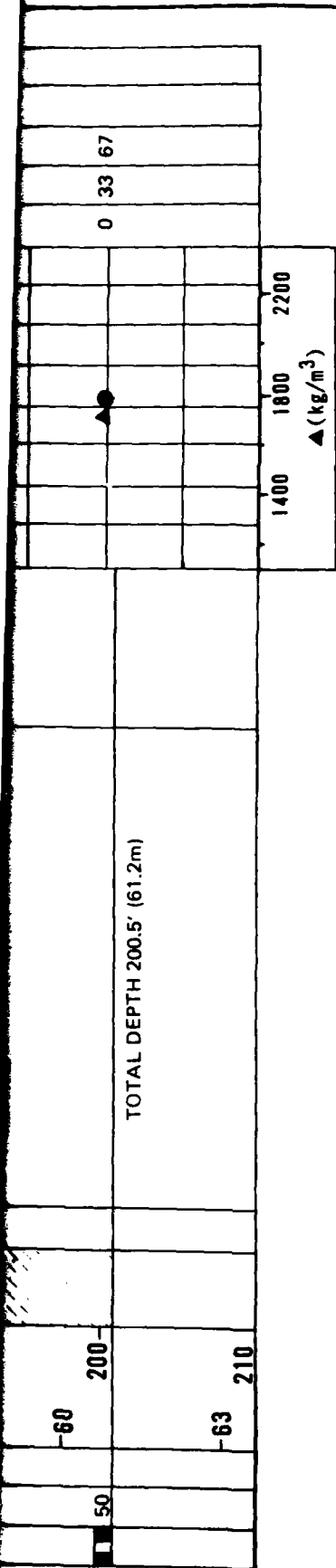


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**EXPLANATION**

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

† - TEST LOCATION APPROXIMATELY 5 FEET FROM BORING

BORING DETAILS

ELEVATION : 4620' (1408m)
 SURFICIAL GEOLOGIC UNIT : A4o
 DATE DRILLED : 10 October 1979
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : 178' (54.3m)

LOG OF BORING WA-B-7
 WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-5-7

FUGRO NATIONAL, INC.

6.0 TRENCH AND TEST PIT LOGS

See Section 5.0, "Boring Logs," for explanation.

FN-TR-27-WA-II

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	loose	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt; little fine to coarse gravel.	vertical walls stable	15	68	17		
	2											
	1											
	4			GP-GC	medium dense	SANDY GRAVEL, white, fine to coarse, poorly graded, dry, angular to subrounded, calcareous; some fine to coarse sand; little slightly plastic clay; stage II caliche (2.0' - 8.5').						
	8											
	2			SM	dense	SILTY SAND, brown, fine to coarse, poorly graded, dry, angular to subrounded, calcareous; little nonplastic silt; little fine to coarse gravel.						
	8				very dense							
	3	10				TOTAL DEPTH 8.5' (2.6m)	excavation capacity of Case 580C backhoe exceeded at 8.5'					
	12											
	4											
	14											
	5	16										
	16											
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 4955' (1510m)
 DATE EXCAVATED : 21 September 1979
 SURFICIAL GEOLOGIC UNIT: A8y/A40
 TRENCH LENGTH : 12.0' (3.7m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-1
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-1

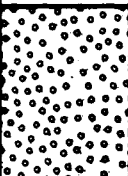
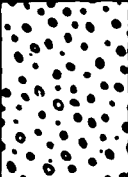
FURRO NATIONAL INC.

24 MAR 81

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FN-TR-27-WA-II

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GM	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace to little nonplastic silt; little cobbles to 10" size; stage I caliche (0.5' - 8.0').	↑ vertical walls stable ↓	56	24	20		
	2											
	1			GP-GM	dense			64	29	7		
	4											
	2											
	6											
	8											
	3	10				TOTAL DEPTH 8.0' (2.4m)	excavation capacity of Case 580C backhoe exceeded at 8.0'					
		12										
	4											
		14										
		16										
	5											
		18										
	6											
		20										

TRENCH DETAILS

SURFACE ELEVATION : 5240' (1597m)
 DATE EXCAVATED : 14 June 1980
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-2
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-6-2

FURRO NATIONAL INC.

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FN-TR-27-WA-II

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		CL-ML	firm	SANDY SILT, light brown, slightly moist, slightly plastic, calcareous; some fine to medium sub-rounded sand.	↑	0	48	52	25	4
	2											
	4			ML	firm	SILT, light gray to white, dry, slightly plastic, calcareous; trace subrounded sand; stage III caliche (3.5' - 8.0').	vertical walls stable	0	5	95	44	7
	6											
	8			SM	medium dense	SILTY SAND, gray-brown, fine to coarse, poorly graded, dry, subrounded, calcareous; little nonplastic silt; interbedded lenses of sandy silt throughout.	↓	3	83	14		
	10											
	12					TOTAL DEPTH 14.0' (4.3m)						
	14											
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 4915' (1498m)
 DATE EXCAVATED : 14 June 1980
 SURFICIAL GEOLOGIC UNIT: A5y/A40
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-3
WAH WAH VALLEY, UTAH

 MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

 FIGURE
 II-6-3

FURRO NATIONAL, INC.

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BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
							GR	SA	FI	LL	PI	
	0				SANDY CLAY, brown, dry, slightly plastic, calcareous; some fine to medium subrounded sand.	vertical walls stable	0	41	59	33	15	
	2		CL	stiff								
	4											
	6											
	8		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, dry, subrounded, calcareous; little nonplastic silt.		1	82	17			
	10		CL	stiff	SILTY CLAY, gray, dry, slightly plastic, calcareous; stage II caliche (7.0' - 10.0').							
	12		SP	dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel; trace cobbles to 10" size.							
	14				TOTAL DEPTH 14.0' (4.3m)							
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5025' (1532m)
 DATE EXCAVATED : 14 June 1980
 SURFICIAL GEOLOGIC UNIT : A40/A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH WA-T-4
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMD

FIGURE
 II-6-4

FURRO NATIONAL, INC.

FN-TR-27-WA-II

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	2		SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt; some fine to coarse gravel; occasional cobbles and boulders to 18" size; stage II caliche (1.0' - 4.5'); stage IV caliche (4.5' - 5.0').	vertical walls stable	27	45	28		
	4			very dense							
	6				TOTAL DEPTH 5.0' (1.5m)	cementation at 5.0' exceeded capacity of Case 580C backhoe					
	8										
	10										
	12										
	14										
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5470' (1667m)
 DATE EXCAVATED : 15 June 1980
 SURFICIAL GEOLOGIC UNIT: A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

**LOG OF TRENCH WA-T-5
 WAH WAH VALLEY, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-5

TUBRO NATIONAL, INC.

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FN-TR-27-WA-II

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic silt; trace gravel; occasional cobbles to 6" size.	vertical walls stable					
		2										
	1			SM	medium dense							
		4										
		6				GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little gravel; trace nonplastic silt; occasional cobbles and boulders to 18" size.	vertical walls stable					
	2											
		8										
		10		SP-SM	medium dense							
	3					TOTAL DEPTH 14.0' (4.3m)						
		12										
	4											
		14										
		16										
	5											
		18										
		20										

TRENCH DETAILS

SURFACE ELEVATION : 5300' (1615m)
 DATE EXCAVATED : 15 June 1980
 SURFICIAL GEOLOGIC UNIT: A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-6
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-6

FURRO NATIONAL, INC.

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FN-TR-27-WA-II

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	0										
	2		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic silt; trace gravel.		6	61	33	35	10
	1										
	4										
	6				GRAVELLY SAND, brown, fine to coarse, well graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; occasional cobbles to 6" size.						
	2					vertical walls stable	39	57	4		
	6		SW	medium dense							
	3										
	10										
	12										
	4										
	14				TOTAL DEPTH 14.0' (4.3m)						
	16										
	5										
	18										
	6										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5510' (1679m)
 DATE EXCAVATED : 15 June 1980
 SURFICIAL GEOLOGIC UNIT: A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-7
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

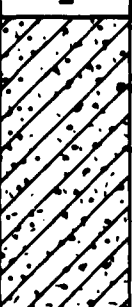
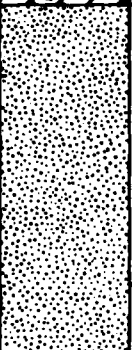
FIGURE
 II-6-7

TUBRO NATIONAL, INC.

24 MAR 81

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BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS										
							GR	SA	FI	LL	PI						
	0		ML	firm	SANDY SILT, light brown, dry, nonplastic, calcareous; some fine to coarse subrounded sand; trace gravel.	↑ vertical walls stable ↓	6	43	51	23	3						
	2																
	4																
	6																
	8		SP-SM	dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine gravel; trace nonplastic silt; occasional cobbles and boulders to 20" size (5.0' - 7.5').		22	66	12								
	10																
	12			very dense	TOTAL DEPTH 11.0' (3.4m)												
	14																
	16																
	18																
	20																

TRENCH DETAILS

SURFACE ELEVATION : 5180' (1579m)
 DATE EXCAVATED : 15 June 1980
 SURFICIAL GEOLOGIC UNIT: A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH WA-T-8
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-8

FUGRO NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt; trace gravel; stage III caliche (1.0' - 2.0').	vertical walls stable					
	2			SM	medium dense							
	4											
	6											
	8					GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine gravel; trace nonplastic silt.	vertical walls stable					
	10			SW-SM	dense			40	55	5		
	12											
	14											
	16					TOTAL DEPTH 14.0' (4.3m)						
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5630' (1698m)
 DATE EXCAVATED : 16 June 1980
 SURFICIAL GEOLOGIC UNIT : A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-9
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-9

FUSCO NATIONAL, INC.

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BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	2		SW-SM				39	53	8		
	4		SP-SM								
	6			very dense							
	8										
	10										
	12										
	14										
	16										
	18										
	20										
					TOTAL DEPTH 6.0' (1.8m)	cementation at 6.0' exceeded capacity of Case 580C backhoe					

TRENCH DETAILS

SURFACE ELEVATION : 5720' (1743m)
 DATE EXCAVATED : 16 June 1980
 SURFICIAL GEOLOGIC UNIT : A5i
 TRENCH LENGTH : 13.0' (4.0m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-10
 WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-10

FUGRO NATIONAL, INC.

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BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	loose	CLAYEY SAND, brown, fine to medium, poorly graded, moist, subrounded, calcareous; some slightly plastic clay; some fine gravel.	caving	22	38	40	29	11
	2			SP-SM	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, moist, subrounded, calcareous; some fine gravel; trace nonplastic silt.		44	45	11		
	4					GRAVELLY SAND, gray, fine to coarse, poorly graded, dry, subrounded, calcareous; some gravel.						
	6			SP	medium dense							
	8											
	10					TOTAL DEPTH 10.0' (3.0m)	excavation terminated due to excessive caving					
	12											
	14											
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 4760' (1451m)
 DATE EXCAVATED : 17 June 1980
 SURFICIAL GEOLOGIC UNIT: A40
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH WA-T-11
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-11

FUGRO NATIONAL, INC.

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FN-TR-27-WA-II

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GM	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; some fine to coarse subangular to subrounded sand; little nonplastic silt; little cobbles.	vertical walls stable	55	28	17		
		2										
	1	4										
		6										
	2	8										
		10										
	3	12										
		14										
	4	16										
		18										
	5	20										
					very dense	TOTAL DEPTH 11.0' (3.4m)	excavation capacity of Case 580C backhoe exceeded at 11.0'					

TRENCH DETAILS

SURFACE ELEVATION : 5275' (1608m)
 DATE EXCAVATED : 17 June 1980
 SURFICIAL GEOLOGIC UNIT: A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-12
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-12

FUGRO NATIONAL, INC.

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BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SP	medium dense	GRAVELLY SAND, gray-brown, medium to coarse, poorly graded, dry, subrounded, calcareous; some fine subangular to subrounded gravel; trace cobbles to 6" size.		36	61	3		
		2										
		4										
		6										
		8										
		10										
		12										
		14										
	3	10				TOTAL DEPTH 9.0' (2.7m)	excavation terminated due to excessive caving					
		12										
		14										
		16										
		18										
		20										
		22										
		24										

TRENCH DETAILS

SURFACE ELEVATION : 5046' (1538m)
 DATE EXCAVATED : 17 June 1990
 SURFICIAL GEOLOGIC UNIT : A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-13
 WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-13

FUGRO NATIONAL, INC.

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BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	2		GM	dense	SILTY GRAVEL, light brown, coarse, poorly graded, slightly moist, subangular, calcareous; little nonplastic silt; trace fine sand; some cobbles; occasional boulders to 24" size (0.5' - 8.0').	vertical walls stable	77	8	15		
	4		GP	dense	SANDY GRAVEL, gray-brown, fine to coarse, poorly graded, dry, subangular, calcareous; some fine to coarse subangular to subrounded sand; little cobbles (3.5' - 8.0').						
	8		GW-GM	very dense	SANDY GRAVEL, light brown, fine to coarse, well graded, dry, subangular, calcareous; some fine to coarse subangular to subrounded sand; trace nonplastic silt.		58	36	6		
	8				TOTAL DEPTH 8.0' (2.4m)	excavation capacity of Case 580C backhoe exceeded at 8.0'					
	10										
	12										
	14										
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5420' (1652m)
 DATE EXCAVATED : 17 June 1980
 SURFICIAL GEOLOGIC UNIT: A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-14
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-14

FUGRO NATIONAL, INC.

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FN-TR-27-WA-II

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0			firm	SANDY SILT, light brown to brown, slightly moist, nonplastic, calcareous; little fine sub-rounded sand; stage II caliche (3.0' - 9.0' and 11.0' - 14.0'); stage III caliche (9.0' - 11.0').	vertical walls stable	0	14	86		NP
	2											
	4											
	6											
	8											
	10											
	12											
	14											
	16											
	18											
	20											
	22											
						TOTAL DEPTH 14.0' (4.3m)						

TRENCH DETAILS

SURFACE ELEVATION : 4850' (1417m)
 DATE EXCAVATED : 24 June 1980
 SURFICIAL GEOLOGIC UNIT: A5y/A40
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH WA-T-15
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-15

FUGRO NATIONAL, INC.

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BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILTY SAND, light gray, fine to coarse, poorly graded, dry, subrounded, calcareous; some non-plastic silt; little fine gravel.	vertical wells stable	15	58	27		
	2			SM	medium dense							
	4											
	6					CLAY, light gray, slightly moist, highly plastic, calcareous.	vertical wells stable	0	0	100	67	43
	8			CH	stiff							
	10				very stiff							
	12					TOTAL DEPTH 11.0' (3.4m)	excavation capacity of Case 580C backhoe exceeded at 11.0'					
	14											
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 4670' (1423m)
 DATE EXCAVATED : 24 June 1980
 SURFICIAL GEOLOGIC UNIT : A40/A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH WA-T-16
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

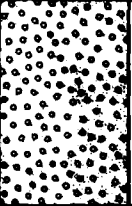
FIGURE
 II-6-16

FUGRO NATIONAL INC.

24 MAR 81

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FN-TR-27-WA-II

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0		GM		SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; some non-plastic silt; stage I caliche (0.5' - 3.0'); stage IV caliche (3.0' - 3.5').	vertical walls stable	45	30	25		
	2			dense							
	1			very dense							
	4				TOTAL DEPTH 3.5' (1.1m)	cementation at 3.5' exceeded capacity of Case 580C backhoe					
	8										
	2										
	8										
	3										
	10										
	12										
	4										
	14										
	5										
	18										
	18										
	8										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5290' (1612m)
 DATE EXCAVATED : 25 June 1980
 SURFICIAL GEOLOGIC UNIT : A5i/A5y
 TRENCH LENGTH : 13.0' (4.0m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-17
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-17

FUGRO NATIONAL INC.

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BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SANDY GRAVEL, gray, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; little nonplastic silt; stage II caliche (0.5' - 2.0'); stage III caliche (2.0' - 3.0').	vertical walls stable	46	37	17		
	2										
	4										
	6										
	8										
	10										
	12										
	14										
	16										
	18										
	20										
	22										
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	90										
	92										
	94										
	96										
	98										
	100										

TRENCH DETAILS

SURFACE ELEVATION : 4810' (1466m)
 DATE EXCAVATED : 25 June 1980
 SURFICIAL GEOLOGIC UNIT: A5i/A40
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-18
WAH WAH VALLEY, UTAH

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FI E
 II-6-18

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24 MAR 81

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FN-TR-27-WA-II

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0		ML	soft	SILT, white, dry, slightly plastic, calcareous; trace fine subangular to subrounded sand.	↑ sloughing ↓	0	11	89	46	12
	2										
	4		CL	stiff	CLAY, olive, slightly moist, medium plastic, calcareous.		0	1	99		
	6										
	8		SP	medium dense	SAND, black, medium to coarse, poorly graded, slightly moist, subangular to rounded, calcareous.						
	10		CL	very stiff	CLAY, olive, slightly moist, medium plastic, calcareous.	vertical walls stable					
	12				TOTAL DEPTH 11.0' (3.4m)	excavation capacity of Case 580C backhoe exceeded at 11.0'					
	14										
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 4620' (1408m)
 DATE EXCAVATED : 20 September 1979
 SURFICIAL GEOLOGIC UNIT: A40
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-19
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-19

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BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some slightly plastic silt; trace gravel.	vertical walls stable					
		2		SP	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel; cobbles and boulders to 14" size.		30	66	4		
		4		SM	medium dense	SILTY SAND, olive-brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some slightly plastic silt; little gravel; some cobbles (3.0' - 9.0').						
		6		GC	medium dense	CLAYEY GRAVEL, olive-gray, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some medium plastic clay; little fine to coarse sand.		49	18	33	49	19
		8										
		10		CL	very stiff	CLAY, olive-gray, moist, highly plastic, calcareous.		0	1	99		
		12				TOTAL DEPTH 12.0' (3.7m)						
		14										
		16										
		18										
		20										

TRENCH DETAILS

SURFACE ELEVATION : 4840' (1475m)
 DATE EXCAVATED : 6 April 1980
 SURFICIAL GEOLOGIC UNIT : A40
 TRENCH LENGTH : 14.5' (4.4m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH WA-T-20
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-6-20

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SOIL SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt.	↑ sloughing ↓					
	1										
	2										
	3		SM	loose							
	4										
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4920' (1500m)
SURFICIAL GEOLOGIC UNIT: A40/A5v

LOG OF TEST PIT WA-P-1

	0				SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subrounded, calcareous; some fine to coarse subangular to subrounded sand; little nonplastic silt; trace cobbles to 6" size; stage I caliche (0.5' - 5.0').	↑ vertical wells stable ↓					
	1										
	2										
	3		GM	dense			43	39	18		
	4										
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5005' (1500m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT WA-P-2

LOGS OF TEST PITS WA-P-1 AND WA-P-2
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-6-21

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BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LE	PI
	0				SANDY SILT, light brown, slightly moist, slightly plastic, calcareous; some fine to coarse subrounded sand.	vertical walls stable					
	1		ML	firm							
	2										
	3				SANDY GRAVEL, dark brown, fine to coarse well graded, dry, subangular to subrounded, calcareous; some medium to coarse sand.		65	33	2		
	4		GW	medium dense							
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5100' (1554m)
SURFICIAL GEOLOGIC UNIT: A5y/A40

LOG OF TEST PIT WA-P-3

	0				SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt; trace fine gravel.	vertical walls stable					
	1						8	67	25		
	2										
	3		SM	medium dense							
	4										
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5230' (1594m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT WA-P-4

LOGS OF TEST PITS WA-P-3 AND WA-P-4
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-6-22

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BUL. SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							BR	SA	FI	LE	PI
	0				GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine gravel; little nonplastic silt.	vertical walls stable					
	1										
	2										
	3		SM	medium dense							
	4										
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5235' (1596m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT WA-P-5

	0				SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt; trace fine gravel.	vertical walls stable					
	1										
	2		SM	medium dense							
	3										
	4				GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, calcareous; some gravel; trace nonplastic silt.	vertical walls stable					
	5		SP-SM	medium dense							
					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5270' (1606m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT WA-P-6

LOGS OF TEST PITS WA-P-5 AND WA-P-6
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-6-23

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N-TR-27-WA-II

SOIL SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	1		ML	firm	SANDY SILT, light brown, dry, slightly plastic, calcareous; some fine to medium subangular to subrounded sand.		2	48	50		
	2										
	3		SW-SM	medium dense	GRAVELLY SAND, gray-brown, fine to coarse, well graded, dry, subangular to subrounded, calcareous; little fine gravel; trace nonplastic silt.	vertical walls stable	19	74	7		
	4										
	5										
					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4960' (1500m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT WA-P-7

	0										
	1				SILTY SAND, light brown, fine to coarse, poorly graded, dry, subrounded, calcareous; little nonplastic silt.		3	78	19		
	2		SM	medium dense		vertical walls stable					
	3										
	4										
	5										
					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4770' (1454m)
SURFICIAL GEOLOGIC UNIT: A5y/A40

LOG OF TEST PIT WA-P-8

LOGS OF TEST PITS WA-P-7 AND WA-P-8
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-6-24

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BULL. SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	COND'S. & RECY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LE	PI
	0				SILTY SAND, light brown, fine to coarse, poorly graded, dry to moist, subrounded, calcareous; some nonplastic silt; trace fine gravel.						
	1						11	56	33		
	2		SM	medium dense		vertical walls stable					
	3										
	4										
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4756' (1449m)
SURFICIAL GEOLOGIC UNIT: A40/A5y

LOG OF TEST PIT WA-P-9

	0				SILTY CLAY, light brown, slightly moist, slightly plastic, calcareous.						
	1										
	2		CL	firm		vertical walls stable					
	3										
	4		ML	firm	SILT, light brown, dry, nonplastic, calcareous; trace fine subrounded sand; stage II caliche (3.5' - 5.0').						
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4640' (1414m)
SURFICIAL GEOLOGIC UNIT: A4

LOG OF TEST PIT WA-P-10

LOGS OF TEST PITS WA-P-9 AND WA-P-10
WAH WAH VALLEY, UTAH

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FIGURE
II-6-25

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BUL. SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry to slightly moist, subangular, calcareous; some fine to coarse sand; some non-plastic silt; trace cobbles to 8" size; stage I caliche (0.5' - 5.0').						
	1										
	2										
	3		GM	dense		vertical walls stable					
	4										
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5035' (1535m)
SURFICIAL GEOLOGIC UNIT: A40/A5y

LOG OF TEST PIT WA-P-11

	0				SILTY SAND, brown, fine to coarse, poorly graded, moist, subrounded, calcareous; some non-plastic silt; little fine subangular to subrounded gravel.						
	1										
	2										
	3		SM	medium dense		vertical walls stable					
	4										
	5		GP, GM	medium dense	SANDY GRAVEL, brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse sand; trace nonplastic silt.						
					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 5080' (1548m)
SURFICIAL GEOLOGIC UNIT: A5y/A40

LOG OF TEST PIT WA-P-12

LOGS OF TEST PITS WA-P-11 AND WA-P-12
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
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FIGURE
II-6-26

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BUL. SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, gray, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel; little nonplastic silt; trace cobbles and boulders to 20" size; stage III caliche (0.5' - 2.5').	vertical walls stable					
	1			SM	dense							
	2				very dense							
	3	1				TOTAL DEPTH 2.5 (0.8m)	cementation at 2.5' exceeded capacity of Case 580C backhoe					
	4											
	5											

SURFACE ELEVATION: 5595' (1706m)
SURFICIAL GEOLOGIC UNIT: A5i/A5y

LOG OF TEST PIT WA-P-13

	0	0				SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; some fine gravel.	vertical walls stable					
	1											
	2											
	3	1		SM	medium dense			24	42	34		
	4											
	5					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4955' (1510m)
SURFICIAL GEOLOGIC UNIT: A5y/A40

LOG OF TEST PIT WA-P-14

LOGS OF TEST PITS WA-P-13 AND WA-P-14
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMD

FIGURE
II-6-27

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BUL. SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				GRAVELLY SAND, gray, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine gravel; little nonplastic silt.	vertical walls stable					
	1		SM	dense			26	54	20		
	2										
	3		SW	dense	GRAVELLY SAND, light brown, fine to coarse, well graded, dry, subangular to subrounded, calcareous; little fine gravel.		18	79	3		
	4										
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4735' (1443m)
SURFICIAL GEOLOGIC UNIT: A5y/A40

LOG OF TEST PIT WA-P-15

	0				SILTY CLAY, light brown, slightly moist, slightly plastic, calcareous; trace fine subrounded sand.	vertical walls stable					
	1		CL-ML	firm			0	10	90	28	6
	2										
	3										
	4										
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4655' (1417m)
SURFICIAL GEOLOGIC UNIT: A40

LOG OF TEST PIT WA-P-16

LOGS OF TEST PITS WA-P-15 AND WA-P-16
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
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FIGURE
II-6-28

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BUL. SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	P'
	0				Interbedded layers of SILTY SAND and SANDY GRAVEL:	vertical walls stable					
	1		SM	loose	SILTY SAND (SM): light olive to brown, fine to medium, poorly graded, dry to slightly moist, calcareous; some nonplastic silt.		2	76	22		NP
	2		GP	dense	SANDY GRAVEL (GP): brown, fine to coarse, poorly graded, dry, subangular to rounded, calcareous; some fine to coarse sand.						
	3										
	4		SM	medium dense							
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4750' (1448m)
SURFICIAL GEOLOGIC UNIT: A40

LOG OF TEST PIT WA-P-17

	0				SAND, light brown, fine to medium, poorly graded, dry, subangular to subrounded, calcareous; trace nonplastic silt.	vertical walls stable					
	1						1	91	8		
	2		SP-SM	medium dense							
	3										
	4		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt; little fine to coarse gravel.		15	39	46		
	5				TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4720' (1439m)
SURFICIAL GEOLOGIC UNIT: A40

LOG OF TEST PIT WA-P-18

LOGS OF TEST PITS WA-P-17 AND WA-P-18
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-6-29

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BUL. SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LC	PI
	0										
	1		GP- GM	medium stiff	SANDY GRAVEL, brown to red brown, fine to coarse, poorly graded, dry, subangular to rounded, calcareous; some fine to coarse sand; trace silt; some cobbles and boulders; stage I caliche (0.5' - 2.5').	vertical walls stable					
	2										
	3		CL	stiff	SILTY CLAY, olive, slightly moist, slightly to medium plastic, calcareous.						
	4										
	5										
					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4720' (1439m)
SURFICIAL GEOLOGIC UNIT: A40

LOG OF TEST PIT WA-P-19

	0										
	1		SM	medium dense	SILTY SAND, light brown, fine to medium, poorly graded, moist, subangular to subrounded, calcareous; little nonplastic silt.	sloughing					
	2										
	3		SP	medium dense	SAND, white to light gray, fine to coarse, poorly graded, dry, subangular to subrounded; trace fine gravel.						
	4										
	5										
					TOTAL DEPTH 5.0' (1.5m)						

SURFACE ELEVATION: 4720' (1439m)
SURFICIAL GEOLOGIC UNIT: A40

LOG OF TEST PIT WA-P-20

LOGS OF TEST PITS WA-P-19 AND WA-P-20
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-6-30

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7.0 SURFICIAL SAMPLE LOGS

Explanation: Finalized logs of the surficial samples are presented in this section. Explanations of the column headings on the logs are as follows:

- A. Designations - Surficial samples are identified as follows:
 - WA-CS-1
 - WA - abbreviation for the valley (e.g., WA - Wah Wah)
 - CS - abbreviation for surficial sample
 - 1 - number of activity
- B. Ground Surface Elevation - Indicated elevations on the logs are estimated from topographic maps of the study area within an accuracy of half the contour interval.
- C. Surficial Geologic Unit - Indicates the surficial geologic unit in which the activity is located.
- D. Depth - Indicates depth interval for which soil description is given.
- E. USCS - Unified Soil Classification Symbol; see Table II-5-1 of Section 5.0, "Boring Logs," for details of USCS.
- F. Soil Description - Soil is described based on field visual descriptions and/or laboratory test results. See Section 5.0, "Boring Logs," for procedures of soil description.
- G. Sieve Analysis, LL and PI - These are from results of laboratory tests. See Section 5.0, "Boring Logs," for explanation.

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ACTIVITY NUMBER	GROUND SURFACE ELEVATION, FEET (METERS)	SURFICIAL GEOLOGIC UNIT	DEPTH, FEET (METERS)	USCS	SOIL DESCRIPTION	SIEVE ANALYSIS				
						GR	SA	FI	LL	PI
WA-CS-1	4835 (1474)	A40/A5y	0.0 - 2.0 (0.0 - 0.6)	SP-SM	SAND, light brown, fine to medium, poorly graded, subangular to subrounded, calcareous; trace nonplastic silt.					
WA-CS-4	5020 (1530)	A40/A5y	0.0 - 2.0 (0.0 - 0.6)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, angular to subrounded, calcareous; little nonplastic silt.					
WA-CS-5	5435 (1657)	A5i	0.0 - 3.0 (0.0 - 0.9)	SM	GRAVELLY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; some fine to coarse gravel; little nonplastic silt; little cobbles to 10" size; stage I caliche (0.5' - 3.0').					
WA-CS-8	4960 (1512)	A5y/A40	0.0 - 2.0 (0.0 - 0.6)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous; some nonplastic silt; little fine gravel.	14	40	46		
			2.0 - 3.0 (0.6 - 0.9)	GP-GM	SANDY GRAVEL, light brown, fine, poorly graded, subrounded, calcareous; some fine to coarse sand; trace nonplastic silt; occasional cobbles to 6" size.	61	30	9		
WA-CS-10	4920 (1500)	A40/A5y	0.0 - 3.0 (0.0 - 0.9)	ML	SANDY SILT, light brown, slightly plastic, calcareous; some fine to coarse subrounded sand.					
WA-CS-11	4975 (1516)	A40/A5y	0.0 - 3.0 (0.0 - 0.9)	SC	CLAYEY SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous; some slightly plastic clay; trace fine gravel.	8	56	36	28	12
WA-CS-13	6000 (1829)	A40/A5y	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some nonplastic silt.					
WA-CS-15	5335 (1626)	A5y	0.0 - 2.5 (0.0 - 0.8)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some nonplastic silt; trace fine gravel; stage II caliche (1.0' - 2.5').					
			2.5 - 3.0 (0.8 - 0.9)	SP	GRAVELLY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; little fine gravel.					
WA-CS-18	5395 (1644)	A5i	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some slightly plastic silt.					
WA-CS-20	5230 (1594)	A5i	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some slightly plastic silt; trace fine gravel.	7	63	30		
WA-CS-23	5365 (1635)	A5y	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; little nonplastic silt; trace fine gravel.					

LOGS OF SURFICIAL SOIL SAMPLES
WAH WAH VALLEY, UTAH

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FIGURE
II-7-1
1 OF 3

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ACTIVITY NUMBER	GROUND SURFACE ELEVATION, FEET (METERS)	SURFICIAL GEOLOGIC UNIT	DEPTH, FEET (METERS)	USCS	SOIL DESCRIPTION	SIEVE ANALYSIS				
						GR	SA	FI	LL	PI
WA-CS-26	5560 (1696)	A5y	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; little nonplastic silt; little fine gravel.					
WA-CS-28	5110 (1558)	A5y/A40	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some nonplastic silt; little fine gravel.	20	56	24		
WA-CS-30	5196 (1583)	A5i	0.0 - 3.0 (0.0 - 0.9)	SM	GRAVELLY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some fine to coarse gravel; some nonplastic silt; trace cobbles to 10" size.	37	37	26		
WA-CS-32	4875 (1486)	A5y	0.0 - 3.0 (0.0 - 0.9)	SP-SM	SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; trace nonplastic silt; trace fine gravel.					
WA-CS-34	4780 (1451)	A40	0.0 - 2.5 (0.0 - 0.8)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous; some nonplastic silt; trace fine gravel.					
			2.5 - 3.0 (0.8 - 0.9)	SW	GRAVELLY SAND, gray, fine to coarse, well graded, calcareous; some fine to coarse gravel; stage I caliche.	44	54	2		
WA-CS-37	4920 (1500)	A5y/A40	0.0 - 3.0 (0.0 - 0.9)	GM	SANDY GRAVEL, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some fine to coarse sand; little nonplastic silt; little cobbles to 10" size.	60	26	14		
WA-CS-41	4706 (1434)	A5y/A40	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown to brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some nonplastic silt; some fine subangular gravel; occasional cobbles to 6" size.	24	46	30		
WA-CS-43	4666 (1422)	A40/A5y	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, gray, fine to medium, poorly graded, subrounded, calcareous; little nonplastic silt.	3	79	18		
WA-CS-45	4690 (1430)	A40/A5y	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some nonplastic silt.					
WA-CS-47	4640 (1414)	A4	0.0 - 3.0 (0.0 - 0.9)	ML	SILT, light brown, slightly plastic, calcareous.	0	0	100	34	6
WA-CS-49	4700 (1433)	A5y/A40	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to medium, poorly graded, subrounded, calcareous; some nonplastic silt.	0	71	29		
WA-CS-52	4690 (1490)	A5i/A40	0.0 - 3.0 (0.0 - 0.9)	GM	SANDY GRAVEL, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some fine to coarse sand; little nonplastic silt; occasional cobbles to 5" size.	55	30	15		

LOGS OF SURFICIAL SOIL SAMPLES
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-7-1
2 OF 3

FUGRO NATIONAL INC.

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FN-TR-27-WA-II

ACTIVITY NUMBER	GROUND SURFACE ELEVATION, FEET (METERS)	SURFICIAL GEOLOGIC UNIT	DEPTH, FEET (METERS)	USCS	SOIL DESCRIPTION	SIEVE ANALYSIS				
						GR	SA	FI	LL	PI
WA-CS-54	5015 (1529)	A5y/A40	0.0 - 3.0 (0.0 - 0.9)	SM	SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some nonplastic silt; trace fine gravel.					
WA-CS-56	5180 (1573)	A5y/A40	0.0 - 3.0 (0.0 - 0.9)	SM	GRAVELLY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some fine to coarse gravel; little nonplastic silt; stage I caliche (0.5' - 3.0').					
WA-CS-58	5450 (1661)	A5i/A5y	0.0 - 2.5 (0.0 - 0.8)	SM	GRAVELLY SAND, gray, fine to coarse, poorly graded, subangular to subrounded, calcareous; some fine to coarse gravel; some nonplastic silt; stage III caliche (0.5' - 2.5').					
WA-CS-61	4875 (1425)	A40	0.0 - 2.0 (0.0 - 0.6)	SM	SILTY SAND, light brown, fine to medium, poorly graded, subangular to subrounded, calcareous; little nonplastic silt.					
WA-CS-63	4690 (1426)	A40	0.0 - 2.0 (0.0 - 0.6)	SM	SILTY SAND, light brown, fine to medium, poorly graded, subangular to subrounded, calcareous; little nonplastic silt.					
WA-CS-65	4730 (1442)	A40	0.0 - 0.8 (0.0 - 0.2)	SM	GRAVELLY SAND, brown, fine to coarse, poorly graded, subangular to rounded, calcareous; some fine to coarse gravel; some nonplastic silt; some cobbles and boulders.					
			0.8 - 2.0 (0.2 - 0.6)	CL	CLAY, light olive, medium plastic, calcareous.					
WA-CS-67	4730 (1442)	A40	0.0 - 2.0 (0.0 - 0.6)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some nonplastic silt; occasional cobbles and boulders.	4	68	28		
WA-CS-69	4760 (1451)	A40	0.0 - 1.0 (0.0 - 0.3)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some slightly plastic silt.	0	73	27		
			1.0 - 2.0 (0.3 - 0.6)	CH	CLAY, light olive, highly plastic, calcareous.	0	1	99	56	31
WA-CS-71	4720 (1439)	A40	0.0 - 1.5 (0.0 - 0.5)	SM	SILTY SAND, brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some nonplastic silt.	0	64	36		
			1.5 - 2.0 (0.5 - 0.6)	ML	SANDY SILT, white, nonplastic to slightly plastic, calcareous; some fine to medium subangular to subrounded sand.					

LOGS OF SURFICIAL SOIL SAMPLES
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - RMO

FIGURE
II-7-1
3 OF 3

FUSCO NATIONAL, INC.

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8.0 LABORATORY TEST RESULTS

Explanation: Table II-8-1 contains a summary of laboratory test results. This table contains results of sieve analysis; plasticity data; in-situ dry unit weight, moisture content, degree of saturation, and void ratio for drive and Pitcher samples; results of compaction tests; and specific gravity of solids. Other tests such as triaxial compression, unconfined compression, direct shear, consolidation, chemical, and California Bearing Ratio (CBR) are indicated on the table. Tables II-8-2 through II-8-6 and Figures II-8-1 and II-8-3 present results of triaxial compression, unconfined compression, direct shear, consolidation, chemical, and CBR tests.

All tests were performed in general accordance with the American Society for Testing and Materials (ASTM) procedures. The following list presents the ASTM designations for the tests performed during the investigation.

<u>Type of Test</u>	<u>ASTM Designations</u>
Particle Size Analysis	D 422-63
Liquid Limit	D 423-66
Plastic Limit	D 424-59
Unit Weight	D 2937-71
Moisture Content	D 2216-71
Compaction	D 1557-70
Specific Gravity of Solids	D 854-58
Triaxial	D 2850-70
Unconfined Compression	D 2166-66
Direct Shear	D 3080-72
Consolidation	D 2435-70
Test for Alkalinity (pH)	D 1067-70
Water Soluble Sodium	D 1428-64
Water Soluble Chloride	D 512-67
Water Soluble Sulphate	D 516-68
Water Soluble Calcium	D 511-72
Calcium Carbonate	D 1126-67
California Bearing Ratio (CBR)	D 1883-73

Explanation for the tables and figures presented in this section are as follows:

- A. Activity Number - Boring, trench, test pit, or surficial sample designation.
- B. Sample Number - Prefix indicates the type of sample; explanation is at the bottom of the table.
- C. Sample Interval - This is the depth range measured from ground surface over which the sample was obtained.
- D. Percent Finer by Weight - Presents the results of laboratory particle-size analysis (ASTM D 422-63) performed on representative soil samples at the depth indicated. The numbers represent the percent (by dry weight) of the total sample weight passing through each sieve size indicated.
- E. Atterberg Limits (ASTM D 423-66 and D 424-59)
 - LL - Liquid Limit, the water content (as percent of soil dry weight) corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil (ASTM D 423-66).
 - PL - Plastic Limit, the water content corresponding to an arbitrary limit between the plastic and the semisolid state of consistency of a soil (ASTM D 424-59).
 - PI - Plasticity Index, numerical difference between the liquid limit (LL) and the plastic limit (PL) indicating the range of moisture content within which a soil-water mixture is plastic.
 - NP - Nonplastic.
- F. USCS - Unified Soil Classification Symbols are given here; see Table II-5-1 in Section 5.0, "Boring Logs," for complete details of USCS system.

- G. In Situ - Presents results of tests on drive and Pitcher samples.

Dry Unit Weight - indicates dry unit weight of soil determined as per ASTM D 2937-71.

Moisture Content - weight of water reported in percent of dry weight of soil sample (ASTM D 2216-71).

Saturation - the degree of saturation in a soil sample is defined as the ratio (in percent) of the volume of water to the volume of all voids in the soil.

Void Ratio - the numerical ratio of the volume of voids to the volume of solids in a soil specimen.

- H. Compacted - Indicates results of laboratory maximum dry density and optimum moisture content test as per ASTM D 1557-70.

- I. Specific Gravity of Solids (ASTM D 854-58) - Indicates the ratio of 1) the weight in air of a given volume of soil solids at a stated temperature, to 2) the weight in air of an equal volume of distilled water at a stated temperature.

- J. Triaxial - The triaxial compression tests were performed in accordance with the procedures of ASTM D 2850-70. The following explanations and definitions apply.

Triaxial Compression Test - a cylindrical specimen of soil is surrounded by a fluid in a pressure chamber and subjected to an isotropic pressure. An additional compressive load is then applied, directed along the axis of the specimen called the axial load.

Consolidated-Drained (CD) Test - a triaxial compression test in which the soil was first consolidated under an all-around confining stress (test chamber pressure) and was then compressed (and hence sheared) by increasing the vertical stress. "Drained" indicates that excess pore water pressure generated by strains are permitted to dissipate by

the free movement of pore water during consolidation and compression.

Consolidated-Undrained (CU) Test - a triaxial compression test in which essentially complete consolidation under the confining (chamber) pressure is followed by a shear test at constant water content.

Confining Pressure (σ_3) - the isotropic chamber pressure applied to the soil specimen during consolidation and compression.

Maximum Deviator Stress ($\sigma_1 - \sigma_3$) - the difference between the major and minor principal stresses in the specimen at failure. The major principal stress on the specimen is equal to the unit axial load plus the chamber pressure, and the minor principal stress on the specimen is equal to the chamber pressure.

Strain Rate - axial strain, ϵ , at a given stress level is defined as the ratio of the change in length (ΔL) of the specimen to the original length of the specimen (L_0). The rate of strain was controlled during the test so that this ratio increased at equal increments for each minute of testing.

Back Pressure - pressure in excess of atmospheric applied to the pore water of a soil sample. Back pressure is usually applied to 1) increase saturation of the sample, or 2) simulate the actual in-situ pressure regime.

- K. Unconfined Compression - Test procedures were as described in ASTM D 2166-66. Unconfined compressive strength is defined as the load per unit area at which an unconfined prismatic or cylindrical specimen of soil will fail in a simple compression test. In these methods, unconfined compressive strength is taken as the maximum load attained per unit area or the load per unit area at 20 percent axial strain, whichever occurred first during the performance of a test.
- L. Direct Shear - The procedures of ASTM D 3080-72 were followed for direct shear testing. In this test, soil under an

applied normal load is stressed to failure by moving one section of the soil container (shear box) relative to the other section. Normal stress is the value of load per unit area acting perpendicular to the plane of shearing. Maximum shear strength is defined as the maximum resistance (ksf) of a soil to shearing (tangential) stresses.

- M. Consolidation (ASTM D 2435-70) - A consolidation test is a test in which a cylindrical soil specimen is laterally confined in a ring and compressed between porous plates. The term "consolidation," as used here, indicates the gradual reduction in volume of the soil mass resulting from an increase in compressive stress (axial load per unit area).
- N. Chemical - The chemical tests performed on soil samples included: pH; water soluble sodium, chloride, sulphate, calcium; and calcium carbonate content. pH is an index of the acidity or alkalinity of a soil in terms of the logarithm of the reciprocal of the hydrogen ion concentration. ASTM test procedure designations for these chemical tests are included in the list on the first page of these Explanations.
- O. CBR - California Bearing Ratio (CBR) is the ratio (in percent) of the resistance to penetration developed by a subgrade soil to that developed by a standard crushed-rock base material. The procedures for conducting a CBR test were as outlined in ASTM D 1883-73. The materials tested

for CBR were also analyzed for particle-size distribution (ASTM D 422-63) and compaction characteristics (ASTM D 1557-70). The term "percentage of maximum density" indicates the ratio (as a percentage) of the compacted sample dry unit weight to maximum dry density obtained in the laboratory from ASTM D 1557-70, "Moisture-Density Relations of Soils Using 10-pound (4.5-kg) Hammer and 18-inch (457-mm) Drop."

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT											
				STANDARD SIEVE OPENING							U S STANDARD SIEVE				
				BLDRS.	COBBLES		GRAVEL			SAND					
		FEET	METERS	24"	12"	6"	3"	1½"	¾"	3/8"	4	10	40	100	
WAB 1	P 1	0.9 1.7	0.27 0.52					100	99	93	84	75	58	32	
	P 2	4.0 5.0	1.22 1.52						100	98	95	82	82	46	
	D 3	6.7 7.4	2.04 2.26						100	98	93	86	70	39	
	P 4	10.9 11.7	3.32 3.57									100	99	94	
	P 5	15.6 16.2	4.75 4.94												
	P 6	20.6 21.1	6.28 6.43												
	P 7	25.0 25.9	7.62 7.89												
	P 7	25.9 26.8	7.89 8.17												
	P 7	25.9 26.8	7.89 8.17												
	P 7	26.8 27.5	8.17 8.38												
	P 8	30.7 31.4	9.36 9.57												
	P 9	40.9 41.7	12.47 12.71												
	P 10	50.0 50.7	15.24 15.45												
	P 11	60.2 60.9	18.35 18.56												
	P 12	70.0 70.4	21.34 21.46										100	96	83
	P 12	70.4 70.8	21.46 21.58							100	89	69	52	28	16
	P 13	80.5 81.3	24.54 24.78							100	95	90	88	79	57
	P 13	81.3 82.1	24.78 25.02												
	P 13	81.3 82.1	24.78 25.02												
	P 13	82.1 82.9	25.02 25.27												
	P 14	90.0 90.5	27.43 27.58						100	69	64	57	51	38	26
	P 16	110.0 110.9	33.53 33.80								100	99	98	91	45
	P 17	120.0 120.9	36.58 36.85												
	D 18	140.0 140.5	42.67 42.82							100	98	74	49	23	15
	D 19	159.5 159.9	48.62 48.74												
WAB 2	P 1	0.9 1.8	0.27 0.55									100	97	84	
	P 2	3.0 3.5	0.91 1.07												
	P 2	3.9 4.7	1.19 1.43								100	99	97	94	
	P 3	6.9 7.5	2.10 2.29									100	99	97	
	P 4	10.9 11.8	3.32 3.60												
	D 5	16.0 16.5	4.88 5.03						100	72	55	39	23	12	
	D 7	25.2 25.9	7.68 7.89												
	D 8	30.7 31.4	9.36 9.57												
	D 8	30.7 31.4	9.36 9.57												
	P 9	40.8 41.3	12.44 12.59												
	P 10	50.9 51.8	15.51 15.79												
	P 11	60.0 61.7	18.29 18.81												
	P 12	70.0 70.5	21.34 21.49												
	P 12	70.9 71.4	21.61 21.76												
	P 12	70.9 71.8	21.61 21.88												
	P 12	71.8 72.3	21.88 22.04												
	P 13	80.9 81.7	24.36 24.90												

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

CLASSIFICATION BY WEIGHT							ATTERBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS
U S STANDARD SIEVE NO.				PARTICLE SIZE (mm)							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	
SAND				SILT OR CLAY							(pcf)	(kg/m ³)				(pcf)	(kg/m ³)		
4	10	40	100	200	.005	.001	LL	PL	PI										
84	75	58	32	25						SM	88.8	1424	5.0	15.2	0.90				
95	82	82	46	25						SM	104.5	1674	7.0	30.9	0.61				
93	86	70	39	25						SM	118.5	1898	5.5	35.4	0.42				
	100	59	94	91	80	47	65	21	44	CH	91.4	1464	29.2	83.5	0.84				
										CH	104.5	1674	19.4	85.5	0.61				
										CH	103.9	1664	24.6	100.0	0.62				
				100	91	60				CH	103.7	1661	22.0	95.1	0.62				
							64	22	42	CH	104.5	1674	22.9	100.0	0.61				
										CH	105.6	1692	18.6	84.2	0.60				
										CH	109.7	1757	18.6	53.6	0.54				
				100			67	21	46	CH	109.4	1753	20.7	100.0	0.54				
										CH	108.5	1738	18.5	90.3	0.55				
										CH	107.4	1721	19.4	92.2	0.57				
										CH	114.1	2308	2.9	16.3	0.48				
	100	56	83	79			57	27	30	CH									
69	52	28	16	13						SM									
90	88	79	57	37			25	14	11	SC	109.4	1753	13.8	69.0	0.54				
										SC	110.1	1764	12.6	63.9	0.53				
										SC	110.2	1765	13.4	68.5	0.53				
										SC	111.6	1788	15.7	83.3	0.51				
57	51	38	26	23			48	19	29	GC			15.7				2.75		
99	98	81	45	26						SC	100.2	1605	3.0	35.6	0.68				
										SC	104.4	1672	17.9	78.8	0.61				
74	49	23	15	12						SP SM	130.3	2087	8.8	81.3	0.29				
										SM	112.5	1802	10.0	54.4	0.50				
	100	97	84	75			32	27	5	ML	74.0	1185	11.3	23.9	1.28				
										MH	103.2	1653	24.0	100.0	0.63				
100	99	97	94	92			57	38	19	MH	68.3	1094	15.7	28.9	1.47				
	100	99	97	96			47	30	17	ML	71.0	1137	19.3	37.0	1.46		2.80		
										ML	87.4	1400	9.8	28.4	0.93				
55	39	23	12	9						SW SM									
										SW SM	120.1	1924	6.0	40.2	0.40				
				100			64	22	42	CH	94.0	1506	28.8	98.1	0.79				
										CH	92.3	1479	31.9	104.4	0.83				
										CH	95.9	1536	27.7	99.1	0.76				
										CH	96.1	1540	27.2	97.5	0.75				
				100			64	22	42	CH	94.2	1509	28.0	95.8	0.79				
										CH	89.6	1435	32.9	100.9	0.88				
										CH	92.9	1488	30.8	102.3	0.81				
				100	94	62				CH	90.1	1443	34.5	107.2	0.87				
							56	27	29	CH	92.5	1482	31.6	103.9	0.82				
										CH	99.9	1600	25.7	100.9	0.69				

SATURATION (%)	VOID RATIO	COMPACTED		OPTIMUM MOISTURE (%)	SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		MAXIMUM DRY DENSITY									
		(pcf)	(kg/m³)								
15.2	0.90										
30.9	0.61										
35.4	0.42									*	
93.5	0.84							*			
85.5	0.61										
100.0	0.62										
95.1	0.62					*					
100.0	0.61					*					
84.2	0.60					*					
53.6	0.54					*					
100.0	0.54										
90.3	0.55										
92.2	0.57										
16.3	0.48										
69.0	0.54					*					
63.9	0.53										
68.5	0.53					*					
83.3	0.51					*					
					2.75						
35.6	0.68										
78.8	0.61										
81.3	0.29										
54.4	0.50										
23.9	1.28										
100.0	0.63						*				
28.9	1.47										
37.0	1.46				2.80						
28.4	0.93										
40.2	0.40										
98.1	0.79										
104.4	0.83								*		
99.1	0.76										
97.5	0.75										
95.8	0.79									*	
100.9	0.88					*					
102.3	0.81					*					
107.2	0.87										
103.9	0.82					*					
100.9	0.69										

SUMMARY OF LABORATORY TEST RESULTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II 8-1
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FUGRO NATIONAL, INC.

AFV-01

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING						U S STANDARD SIEV				
				BLDRS.	COBBLES		GRAVEL			SAND				
		FEET	METERS	24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	40	100
WA-B-2	P 14	90.0 90.9	27.43 27.71											
	P-14	90.9 91.8	27.71 27.98											
	P 15	101.0 102.0	30.78 31.09											
	P 16	110.9 111.8	33.80 34.08											
	P 17	121.0 122.0	36.88 37.19											10
	P 18	140.0 140.8	42.67 42.92											
	P 19	151.0 152.0	46.02 46.33											
WA-B-3	D 1	0.6 1.0	0.18 0.30						100	95	88	80	58	3
	D 2	3.7 4.4	1.13 1.34						100	90	81	70	54	38
	D 3	6.2 6.7	1.89 2.04						100	75	58	44	26	12
	D 4	10.3 11.0	3.14 3.35											
	D 5	15.0 15.7	4.57 4.79						100	86	66	45	23	13
	D 6	20.3 21.0	6.19 6.40											
	D 7	25.3 25.9	7.71 7.89						100	95	88	81	68	36
	D 8	31.3 32.0	9.54 9.75											
	P 9	39.0 39.8	11.89 12.13						100	98	94	82	62	40
	D 10	50.1 50.8	15.27 15.48											
	D 11	60.3 61.0	18.38 18.59											
	D 12	70.3 71.0	21.43 21.64							100	98	95	89	70
	D 13	80.3 81.0	24.48 24.69											
	D 14	90.3 91.0	27.52 27.74					100	90	69	54	41	30	18
	P 15	98.0 98.6	29.87 30.05											
	P-15	98.6 99.2	30.05 30.24											
	D 16	110.8 111.5	33.77 33.99						100	94	84	76	64	49
	D-17	120.1 120.8	36.61 36.82											
	D 18	140.3 141.0	42.76 42.98											
	D 19	159.2 159.9	48.52 48.74											
WA-B-4	P 1	1.0 2.0	0.30 0.61								100	98	78	41
	P 2	3.9 4.8	1.19 1.46					100	88	83	80	72	41	27
	P 3	7.0 7.9	2.13 2.41											
	D 4	10.2 10.9	3.11 3.32					100	86	68	55	42	21	7
	D 5	15.3 16.0	4.66 4.88											
	D 6	20.0 20.7	6.10 6.31								100	99	91	61
	D 7	25.7 26.4	7.83 8.05						100	99	98	95	68	38
	D 8	30.2 30.9	9.20 9.42											
	P 9	40.0 41.1	12.19 12.53											
	D 10	41.8 42.5	12.74 12.95						100	76	63	48	32	19
	D 11	50.2 50.9	15.30 15.51											
	D 12	60.3 61.0	18.38 18.59											
	D 13	70.3 71.0	21.43 21.64						100	99	95	81	43	19
	D 14	80.8 81.5	24.63 24.84							100	92	78	57	41

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B,b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

PERCENT PASSING BY WEIGHT							ATTERBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS
U S STANDARD SIEVE NO.				PARTICLE SIZE (mm)							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	
SAND				SILT OR CLAY			(pcf)	(kg/m ³)	(pcf)		(kg/m ³)								
4	10	40	100	200	.005	.001	LL	PL	PI										
				100			56	22	34	CH	103.2	1653	24.0	100.0	0.63				
										CH	103.0	1650	23.4	99.5	0.64				
										CH	93.3	1495	29.4	98.6	0.81				
										CH	101.1	1620	24.5	99.2	0.67				
			100	99			60	23	37	CH	102.0	1634	24.0	99.2	0.65				
										CH	106.8	1711	23.5	100.0	0.58				
										CH	103.3	1655	23.9	100.0	0.63				
88	80	58	37	26						SM			2.8						
81	70	54	38	28						SM	104.5	1674	5.9	26.3	0.61				
58	44	26	12	8						SP SM	111.1	1780	4.8	25.1	0.52				
										GP GM	126.5	2027	4.6	37.5	0.33				
66	45	23	13	10						SW SM	114.2	1829	9.1	51.9	0.48				
										SW SM	114.4	1833	9.4	53.7	0.47				
88	81	68	36	31						SM	120.1	1924	9.9	66.1	0.40				
										SW SM	115.7	1854	5.8	34.5	0.46				
94	82	62	40	25						SM	100.8	1615	13.7	55.2	0.67				
										GP GM	124.2	1990	6.3	47.6	0.36				
										SW SM	114.9	1841	11.5	66.6	0.47				
98	95	89	70	54						ML	107.9	1729	11.1	53.3	0.56				
										ML	109.9	1761	8.9	45.1	0.53				
54	41	30	18	12						GP-GM	122.5	1962	3.4	24.1	0.38				
										ML	84.8	1358	25.1	68.8	0.99				
										SM	101.2	1621	9.5	38.7	0.67				
84	76	64	49	37						SM	111.6	1788	12.3	65.3	0.51				
										GP-GM	128.6	2060	7.5	65.6	0.31				
										ML	109.9	1761	10.9	55.1	0.53				
										GP-GM	126.7	2030	9.0	73.7	0.33				
100	98	78	45	36						SM	95.9	1536	5.3	18.9	0.76				
80	72	41	27	19			23	18	5	SM-SC			8.7						
										SM	81.4	1304	13.1	33.1	1.07				
55	42	21	7	4						SP	120.7	1934	7.4	50.7	0.40				
										SP	123.8	1983	8.7	65.1	0.36				
100	99	91	69	56						ML	98.7	1581	13.4	51.3	0.71				
98	95	68	38	24					NP	SM	113.3	1815	9.3	51.2	0.45			2.71	
										SW SM	118.6	1900	7.5	48.1	0.42				
										SM	93.6	1499	28.4	95.8	0.80				
63	48	32	19	15						SM	109.7	1757	13.6	68.4	0.54				
										SM	114.2	1829	4.9	28.2	0.48				
										SM	111.9	1783	12.3	65.6	0.51				
95	81	43	15	10						SW SM	108.9	1745	10.5	51.7	0.55				
										SM	106.6	1708	5.9	27.5	0.58				

[illegible]

SUMMARY OF LABORATORY TEST RESULTS

WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
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FUGRO NATIONAL, INC.

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[illegible]

		GW GM	118.6
		GP GM	128.4
		GW	
		SM	93.1
		SM	100.4
	NP	SM	106.5
		SM	104.9
43	14	MH	55.6
		CH	95.5
		SP	121.6
		SP	106.4
		CL	109.1
19	34	CH	97.9
		CH	97.1
		CH	98.7
		CH	99.1
		CH	99.7
		CH	98.9
18	39	CH	98.6
		CH	95.0
		CH	98.3

0.5 - 2.0	0.15 - 0.61			
5.0 - 6.0	1.52 - 1.83			
0.5 - 2.0	0.15 - 0.61			
5.0 - 6.0	1.52 - 1.83			
10.0 - 11.0	3.05 - 3.35			
0.5 - 2.0	0.15 - 0.61			
5.0 - 6.0	1.52 - 1.83			
0.5 - 2.0	0.15 - 0.61			
0.5 - 2.0	0.15 - 0.61			
7.0 - 8.0	2.13 - 2.44			
0.5 - 2.0	0.15 - 0.61			
8.0 - 9.0	2.44 - 2.74			
7.0 - 8.0	2.13 - 2.44			
0.5 - 2.0	0.15 - 0.61			
0.5 - 1.5	0.15 - 0.46			
2.0 - 3.0	0.61 - 0.91			
0.5 - 2.0	0.15 - 0.61			
0.5 - 2.0	0.15 - 0.61			

PER BY WEIGHT							ATTERBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS
U S STANDARD SIEVE NO.					PARTICLE SIZE (mm)						DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	
SAND				SILT OR CLAY		(pcf)										(kg/m³)			
4	10	40	100	200	.005	.001	LL	PL	PI		(pcf)	(kg/m³)							
										CH	104.4	1672	22.2	97.9	0.61				
										CL	117.5	1882	20.1	100.0	0.43				
		100	83	67						CI	107.9	1728	21.1	100.0	0.56				
85	75	55	24	17						SM						127.8	2047	9.7	
44	37	29	23	20						GM									
36	27	16	10	7						GP GM									
100	98	85	66	52			25	21	4	CL ML						121.4	1945	12.7	
	100	99	97	95			44	37	7	ML								2.69	
97	88	46	23	14						SM									
100	98	86	69	59			33	18	15	CL						116.4	1865	14.9	
99	93	55	26	17						SM									
73	65	46	34	28						SM									
94	88	60	30	33			35	25	10	SM									
61	41	10	4	4						SW									
94	87	72	62	51			23	20	3	ML									
78	59	25	15	12						SP SM									
60	34	13	7	5						SW SM									
61	46	22	11	8						SW SM						131.0	2099	9.1	
78	76	60	44	40			29	18	11	SC						124.5	1994	11.4	
56	51	33	14	11						SP SM								2.66	
45	37	29	21	17						GM						133.5	2139	8.8	
64	22	7	5	3						SP						133.6	2140	8.5	
23	22	20	17	15						GM									
42	27	13	8	6						GW GM									
	100	98	92	86					NP	ML						109.5	1754	17.4	
100	99	95	72	53						ML								2.64	
85	75	62	37	27						SM						118.5	1898	14.0	
				100			67	24	43	CH									

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COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
MAXIMUM DENSITY	OPTIMUM MOISTURE (%)								
(kg/m ³)									
8	2047	9.7							*
14	1945	12.7	2.69					*	*
6.4	1865	14.9						*	*
10	2099	9.1						*	*
14.5	1994	11.4	2.66						*
13.5	2139	8.8							*
13.6	2140	8.5							*
								*	
19.5	1754	17.4	2.64						*
18.5	1898	14.0							*

SUMMARY OF LABORATORY TEST RESULTS

WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

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FUGRO NATIONAL, INC.

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ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING							U S STANDARD SIEVE			
				BLDRS.	COBBLES		GRAVEL				SAND			
				24"	12"	6"	3"	1½"	¾"	3/8"	4	10	40	100
WA-T-17	B 1	0.5 2.0	0.15 0.61					100	90	79	55	44	36	29
WA-T-18	B 1	0.5 2.0	0.15 0.61					100	91	66	54	45	35	20
	b 2	7.0 8.0	2.13 2.44						100	96	91	86	80	66
WA-T-19	B 1	0.5 2.0	0.15 0.61									100	98	94
	b 2	3.0 4.0	0.91 1.22									100	99	99
WA-T-20	b 2	2.0 3.0	0.61 0.91					100	90	78	70	62	10	4
	B 4	7.0 8.0	2.13 2.44				100	91	72	58	51	46	37	34
	b 5	10.0 11.0	3.05 3.35										100	99
WAP-2	B 1	0.5 2.0	0.15 0.61					100	91	70	57	46	31	22
WAP-3	B 2	3.0 4.0	0.91 1.22					100	88	62	35	12	3	2
WAP-4	B 1	0.5 2.0	0.15 0.61						100	98	92	82	55	32
WAP-5	b 1	0.5 2.0	0.15 0.61						100	87	73	59	34	19
WAP-6	b 1	0.5 2.0	0.15 0.61						100	98	93	83	48	23
WAP-7	b 1	0.5 2.0	0.15 0.61						100	99	98	94	80	63
	b 2	3.0 4.0	0.91 1.22						100	96	81	55	20	8
WAP-8	B 1	0.5 2.0	0.15 0.61							100	97	89	76	42
WAP-9	b 1	0.5 2.0	0.15 0.61						100	95	89	83	69	44
WAP-11	B 1	0.5 2.0	0.15 0.61					100	95	76	62	51	40	30
WAP-12	B 1	0.5 2.0	0.15 0.61						100	91	84	77	69	56
	b 2	4.0 5.0	1.22 1.52					100	86	63	44	30	19	12
WAP-14	b 1	0.5 2.0	0.15 0.61						100	91	76	65	57	44
WAP-15	b 1	0.5 2.0	0.15 0.61						100	91	74	64	45	22
	b 2	3.0 4.0	0.91 1.22					100	97	92	82	55	17	5
WAP-16	B 1	0.5 2.0	0.15 0.61										100	97
WAP-17	b 1	0.5 1.5	0.15 0.46							100	98	96	83	39

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

FINER BY WEIGHT								ATTERBERG LIMITS (b)			USCS (c)	IN-SITU				COMPACTED			SPECIFIC GRAVITY OF SOLIDS
U S STANDARD SIEVE NO.					PARTICLE SIZE (mm)							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		
	SAND				SILT OR CLAY			(pcf)	(kg/m³)	(pcf)		(kg/m³)							
NO.	4	10	40	100	200	.005	.001	LL	PL	PI									
1	55	44	36	29	25						GM								
2	54	45	35	20	17						GM								
3	91	86	80	66	55			21	18	3	ML								
4		100	98	94	89			46	34	12	MI								
5		100	99	99	99						CL								
6	70	62	10	4	4						SP								
7	51	46	37	34	33			49	30	19	GC								
8			100	99	99	85	57				CI								
9	57	46	31	22	18						GM								
10	35	12	3	2	2						GW								
11	92	82	55	32	25						SM					125.7	2014	11.0	
12	73	59	34	19	13						SM								
13	93	83	48	23	17						SM								
14	98	94	80	63	50						ML								
15	81	55	20	8	7						SW-SM								
16	97	89	76	42	19						SM								
17	89	83	69	44	33						SM								
18	62	51	40	30	27						GM								
19	84	77	69	56	40					NP	SM								
20	44	30	19	12	7						GP-GM								
21	76	65	57	44	34						SM								
22	74	64	45	22	20						SM								
23	82	55	17	5	3						SW								
24			100	97	90			28	22	6	CL-ML					114.6	1836	15.7	
25	98	96	83	39	22					NP	SM								

TESTED	OPTIMUM MOISTURE (%)	SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
14	11.0						*	
1836	15.7						*	

SUMMARY OF LABORATORY TEST RESULTS

WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

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FUGRO NATIONAL, INC.

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0.5 - 2.0	0.15 0.61							100	99	95	46
0.5 2.0	0.15 0.61						100	91	86	79	67
2.0 3.0	0.61 0.91					100	99	67	39	28	20
0.5 2.0	0.15 0.61						100	96	92	79	50
0.5 2.0	0.15 0.61						100	98	93	85	59
0.5 2.0	0.15 0.61						100	88	80	72	49
0.5 2.0	0.15 0.61					100	90	72	63	54	40
2.5 3.0	0.76 0.91					100	95	75	56	35	12
0.5 2.0	0.15 0.61					100	85	62	40	29	20
0.5 2.0	0.15 0.61					100	96	84	76	69	57
0.5 2.0	0.15 0.61						100	98	91	85	78
0.5 2.0	0.15 0.61										
0.5 2.0	0.15 0.61								100	98	85
0.5 2.0	0.15 0.61					100	87	57	45	37	30
0.5 2.0	0.15 0.61						100	99	96	91	74
0.5 1.0	0.15 0.61								100	95	42
1.5 2.0	0.46 0.61										
0.5 1.0	0.15 0.30								100	89	66
1.0 1.5	0.30 0.46							100	99	96	80
2.0 2.5	0.61 0.76							100	99	95	73
3.0 3.5	0.91 1.07								100	98	75
4.0 4.5	1.22 1.37						100	98	96	93	76
1.0 1.5	0.30 0.46							100	95	98	66

			SP SM			
			SM			
		NP	SM			
			SM			
			GP GM			
28	16	12	SC			
			SM			
			SM			
			SM			
			SW			
			GM			
			SM			
			SM			
34	28	6	ML			
			SM			
			GM			

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SUMMARY OF LABORATORY TEST RESULTS

WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
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FUGRO NATIONAL, INC.

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NOTES:

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FINER BY WEIGHT

U S STANDARD SIEVE NO.						PARTICLE SIZE (mm)		ATTERBERG LIMITS (b)			USCS (c)	DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	SPECIFIC GRAVITY OF SOLIDS
SAND					SILT OR CLAY			LL	PL	PI		(pcf)	(kg/m ³)				(pcf)	(kg/m ³)		
3/8"	4	10	40	100	200	.005	.001													
100	96	89	49	19	13						SM		5.0				121.8	1951	12.0	
89	63	38	16	7	6						SW SM		3.2							
94	85	75	47	27	20						SM		5.6							
94	88	80	53	32	24						SM		5.5							
92	84	73	45	25	18						SM		4.6				125.8	2015	10.5	
94	88	79	46	20	15						SM		4.9							
100	99	98	77	47	35			25	18	7	SM-SC		5.4							
											SM-SC		7.6							
	100	95	81	73	71			43	25	18	CL		10.9							
											CL		4.6							
			100	96	84			25	18	7	CL ML		8.7							
		100	99	96	87			25	20	5	CL ML		7.9							
	100	98	93	77	65			26	18	8	CL		9.3							
											CL		11.5							
100	96	90	76	38	23						SM		4.5							
86	83	77	65	30	18						SM		4.4							
		100	98	92	86			35	27	8	ML		11.3							
											ML		11.5							
		100	99	97	95			47	38	9	ML		14.6				102.3	1630	22.0	
		100	99	98	97			49	35	14	ML		12.5							
99	91	84	69	45	29						SM		4.5				126.7	2030	10.0	
100	90	81	63	36	24						SM		7.7							

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FUGRO NATIONAL, INC.

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SUMMARY OF TRIAXIAL COMPRESSION TEST RESULTS WAH WAH VALLEY, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - BMO	TABLE II-8-2
UGRO NATIONAL, INC. USAF-0	

CHECKED BY _____ / _____
APPROVED BY _____ / _____

[illegible]

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - GND

TABLE
II-8.3

FUSRO NATIONAL, INC.

BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	NORMAL STRESS		MAXIMUM SHEAR STRENGTH	
		FEET	METERS		ksf	kN/m ²	ksf	kN/m ²
WA-B-1	P-4	10.9 - 11.7	3.32 - 3.57	CH	1.0	48	1.32	63
					1.5	72	1.40	67
					2.0	96	1.69	81
WA-B-3	D-2	3.7 - 4.4	1.13 - 1.34	SM	0.4	19	0.93	45
					0.6	29	0.98	47
WA-B-3	D-12	70.3 - 71.0	21.43 - 21.64	ML	7.0	335	8.82	422
					9.5	455	10.51	503
WA-B-4	D-4	10.2 - 10.9	3.11 - 3.32	SP	1.0	48	1.06	51
					1.5	72	2.44	117
					2.0	96	2.27	109
WA-B-4	D-7	25.7 - 26.4	7.83 - 8.06	SM	3.8	182	3.67	176
					5.0	239	5.39	258
WA-B-4	D-14	80.8 - 81.5	24.63 - 24.84	SM	8.0	383	8.00	383
					10.0	479	9.40	450
WA-B-6	D-6	19.0 - 19.7	5.79 - 6.00	SM	2.0	96	3.50	168
					4.0	192	4.97	238
					8.0	383	9.41	451

DIRECT SHEAR TEST RESULTS
WAH WAH VALLEY, UTAH

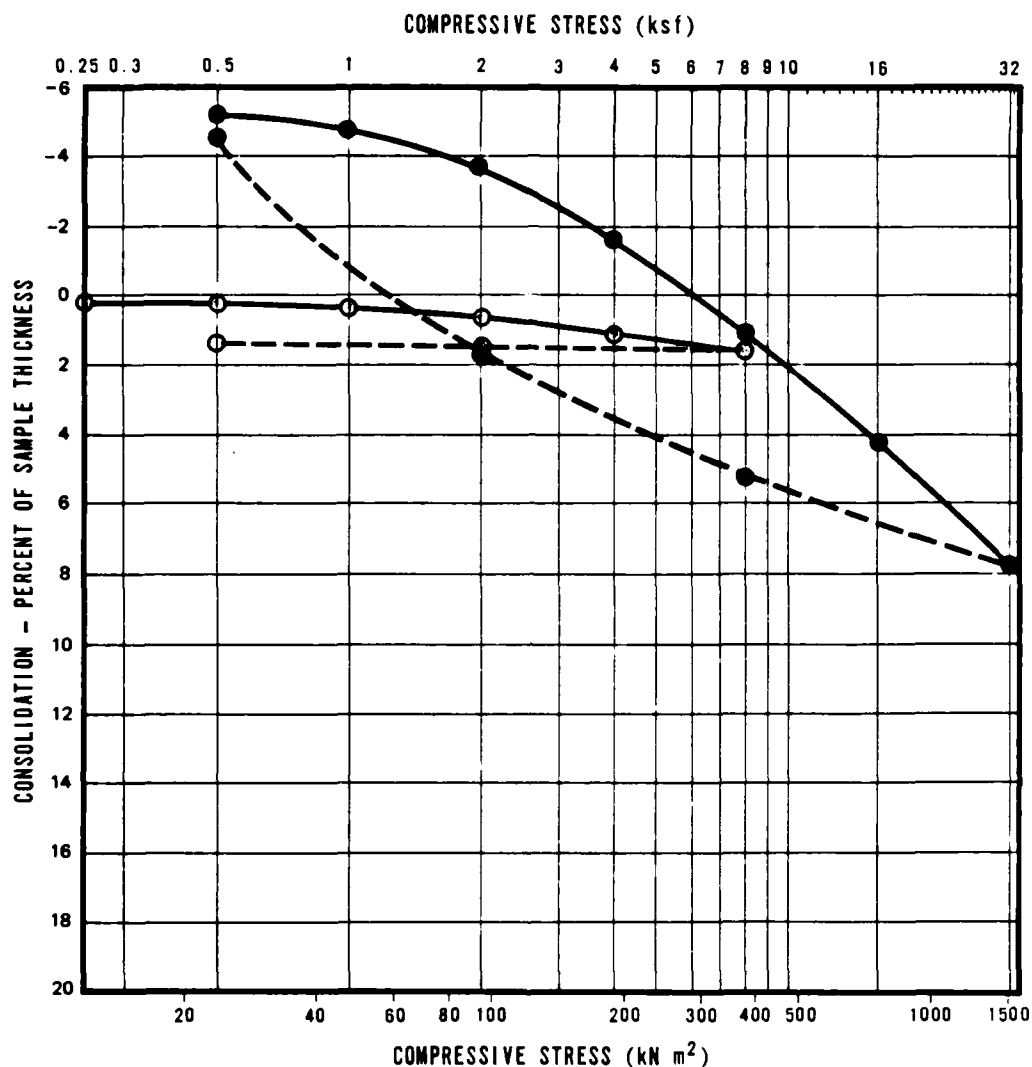
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-8-4

FUGRO NATIONAL INC.

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SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m ³			
○	WA-B-2	D-8	30.7 - 31.4	9.36 - 9.57	CH	92.3	1479	31.9	0.83	104.4

- AT FIELD MOISTURE
● AFTER ADDITION OF WATER

— COMPRESSION
- - - REBOUND

CONSOLIDATION TEST RESULTS
WAH WAH VALLEY, UTAH

MR SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

FIGURE
II-8-1

FUGRO NATIONAL, INC.

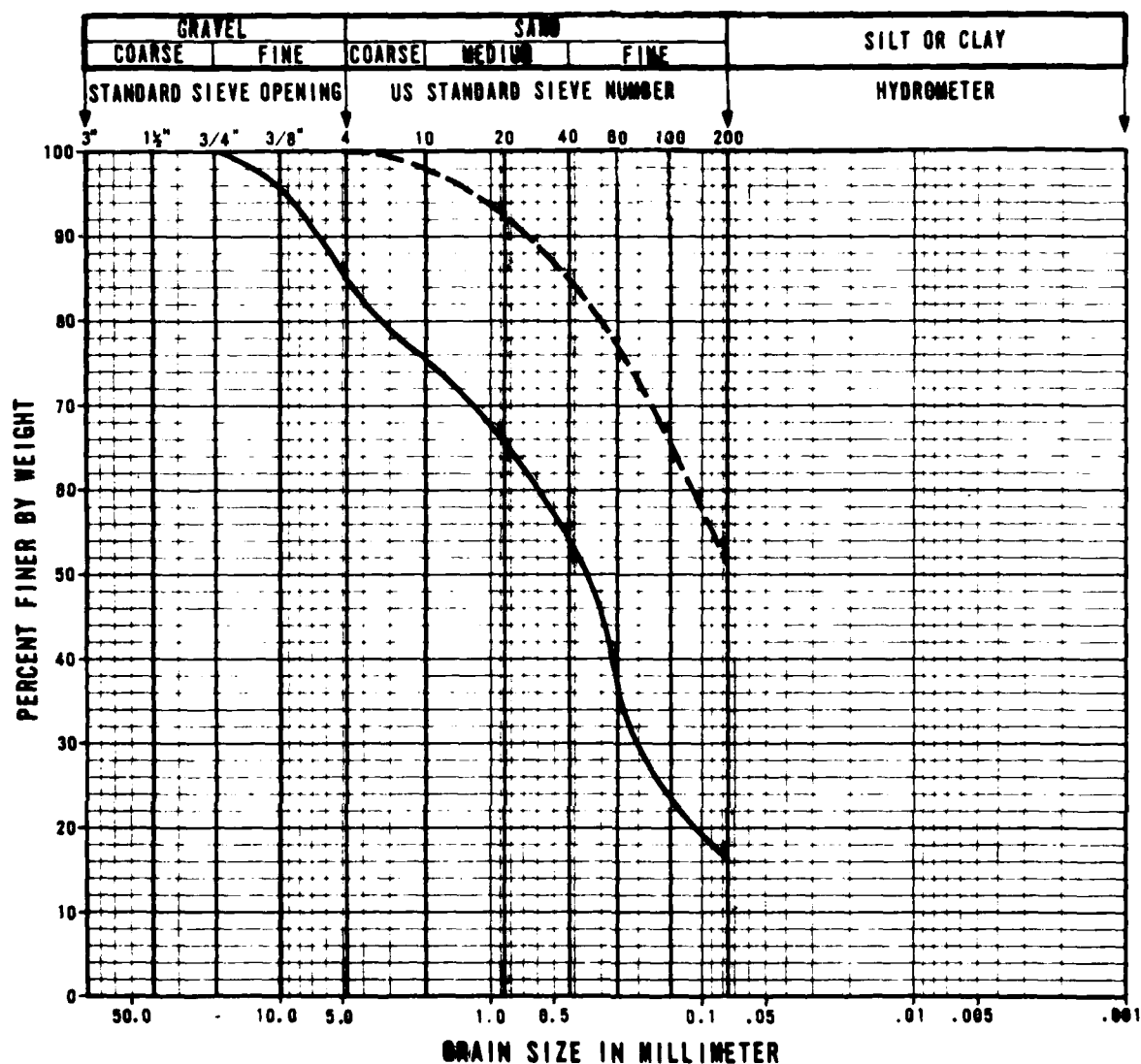
24 MAR 81

USAF-08

CHECKED BY _____ APPROVED BY _____

USAF-08

FN-TR-27-WA-II



SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	A	WA-T-1	0.5 - 2.0	0.15 - 0.61	SM
- -	B	WA-T-3	0.5 - 2.0	0.15 - 0.61	CL-ML

GRAIN SIZE CURVES, CBR TESTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

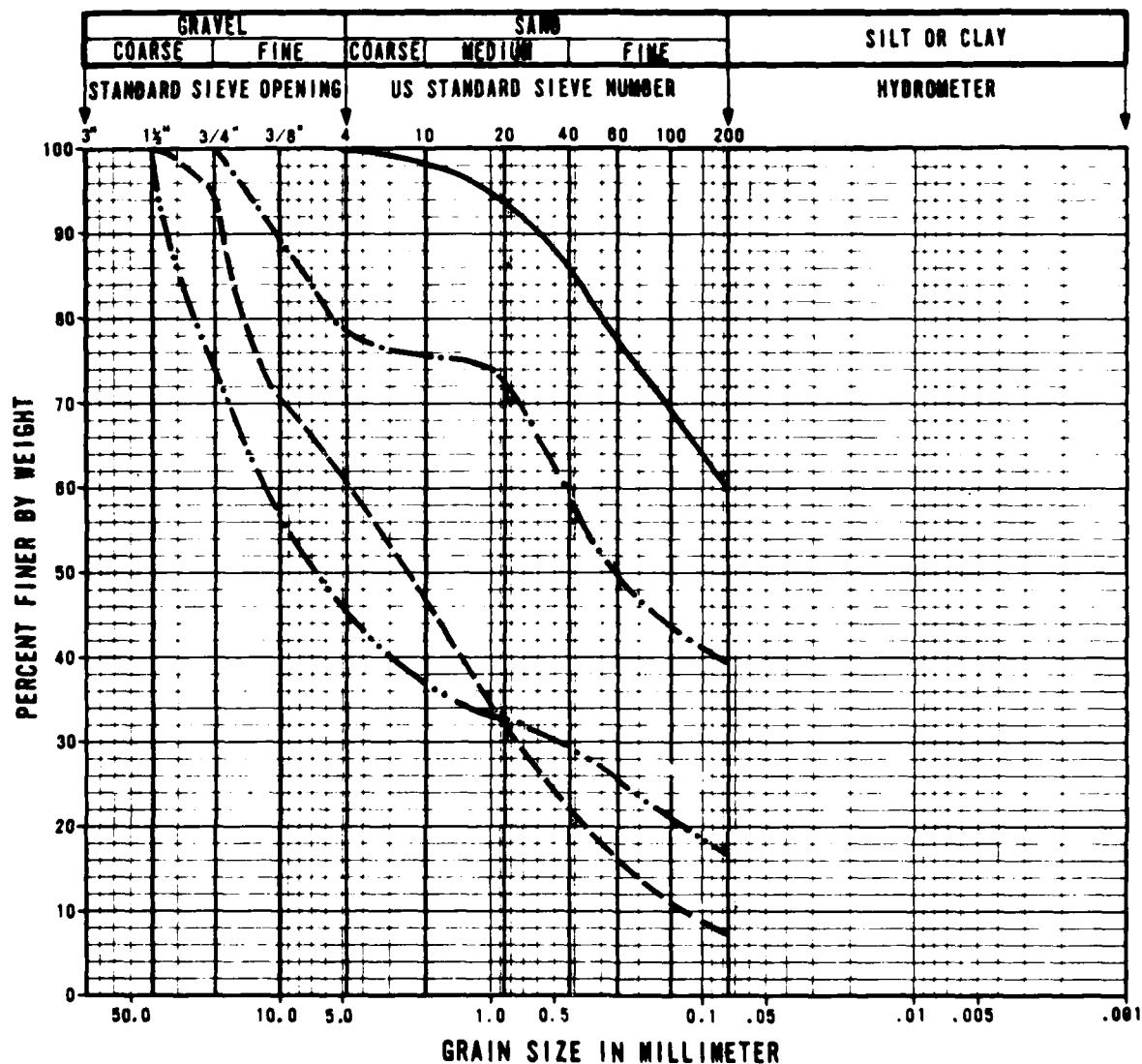
FIGURE
II-8-2
1 OF 5

INSTRON NATIONAL LAB.

24 MAR 81

USAF-10

FN-TR-27-WA-II



SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	C	WA-T-4	0.5 - 2.0	0.15 - 0.61	CL
- - -	D	WA-T-10	0.5 - 2.0	0.15 - 0.61	SW-SM
- · - ·	E	WA-T-11	0.5 - 1.5	0.15 - 0.46	SC
- · · ·	F	WA-T-12	0.5 - 2.0	0.15 - 0.61	GM

GRAIN SIZE CURVES, CBR TESTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE DMO

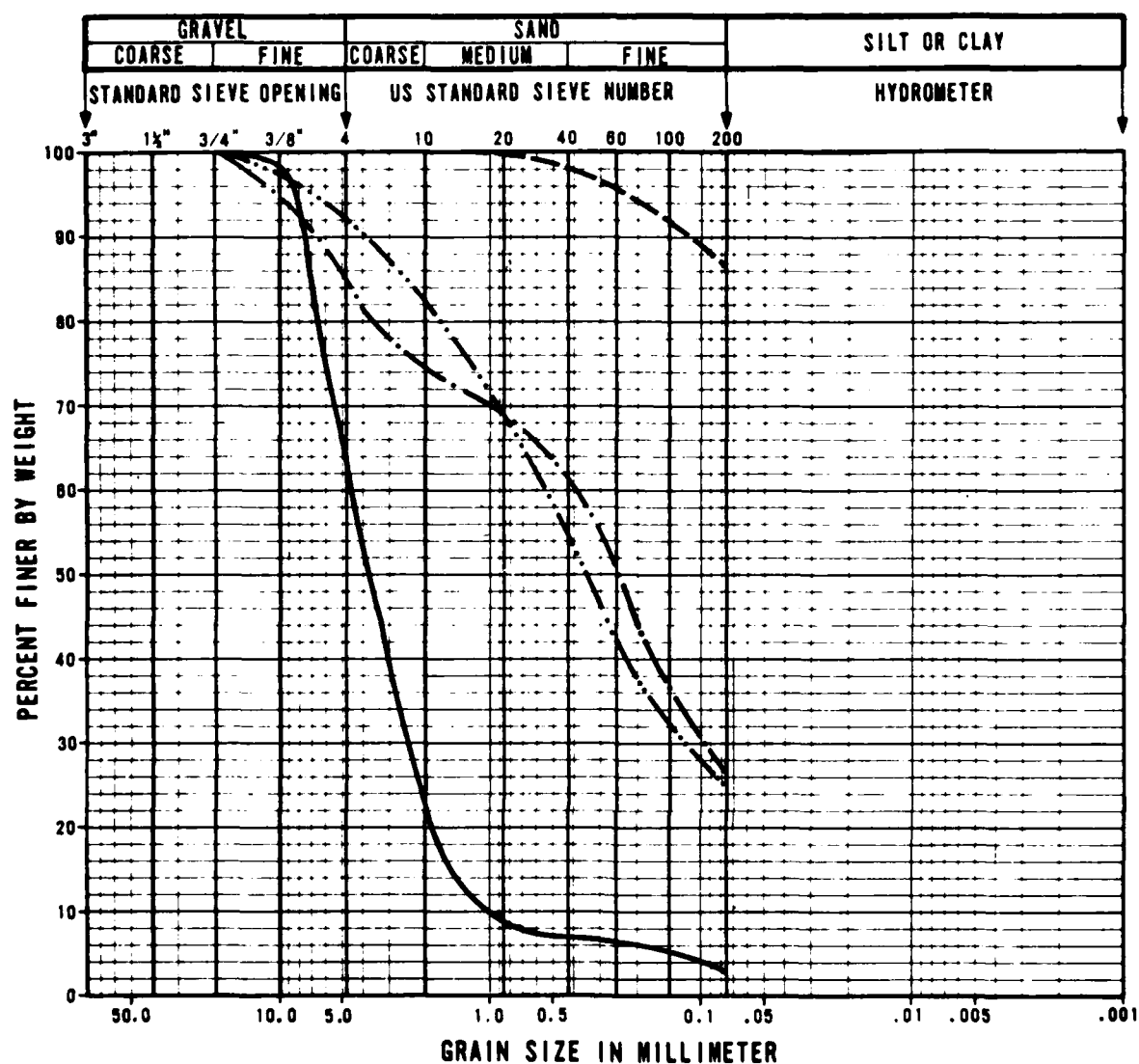
FIGURE
II-8-2
2 OF 5

FUGRO NATIONAL INC.

24 MAR 81

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FN-TR-27-WA-II



SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	G	WA-T-13	0.5 - 2.0	0.15 - 0.61	SP
---	H	WA-T-15	0.5 - 2.0	0.15 - 0.61	ML
- · -	I	WA-T-16	0.5 - 2.0	0.15 - 0.61	SM
···	J	WA-P-4	0.5 - 2.0	0.15 - 0.61	SM

GRAIN SIZE CURVES, CBR TESTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

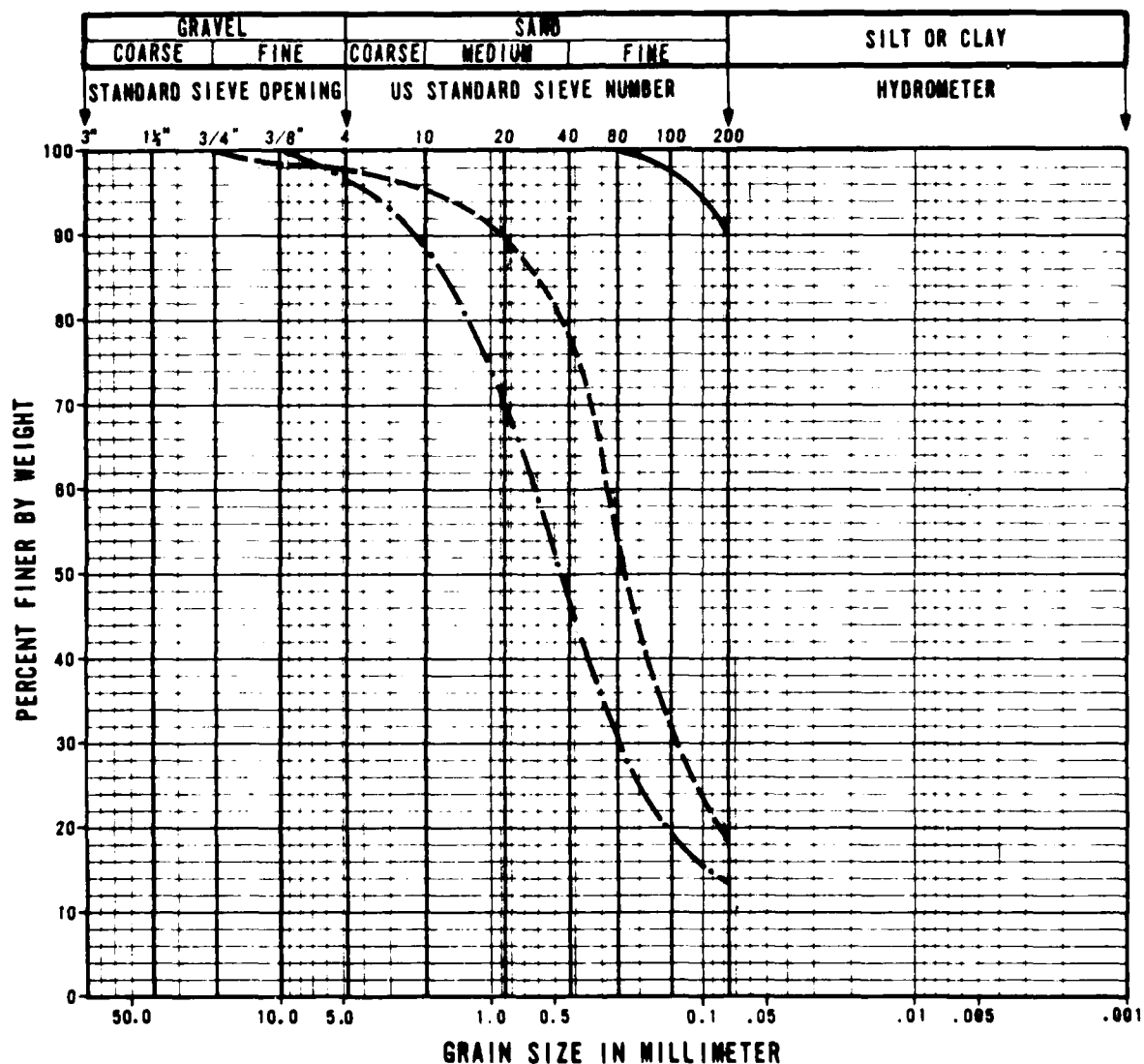
FIGURE
II-8-2
3 OF 5

FURRO NATIONAL, INC.

24 MAR 81

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FN-TR-27-WA-II



SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	K	WA-P-13	0.5 - 2.0	0.15 - 0.61	CL-ML
- -	L	WA-CS-43	0.5 - 2.0	0.15 - 0.61	SM
- · -	M	WA-F-2	2.0 - 2.5	0.61 - 0.76	SM

GRAIN SIZE CURVES, CBR TESTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
1-8-2
4 OF 5

FURRO NATIONAL INC.

24 MAR 81

USAF-10

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VERIFICATION STUDY - WAH WAH VALLEY, UTAH. VOLUME II. GEOTECHNI--ETC(U)
MAR 81
FN-TR-27-WA-VOL-2

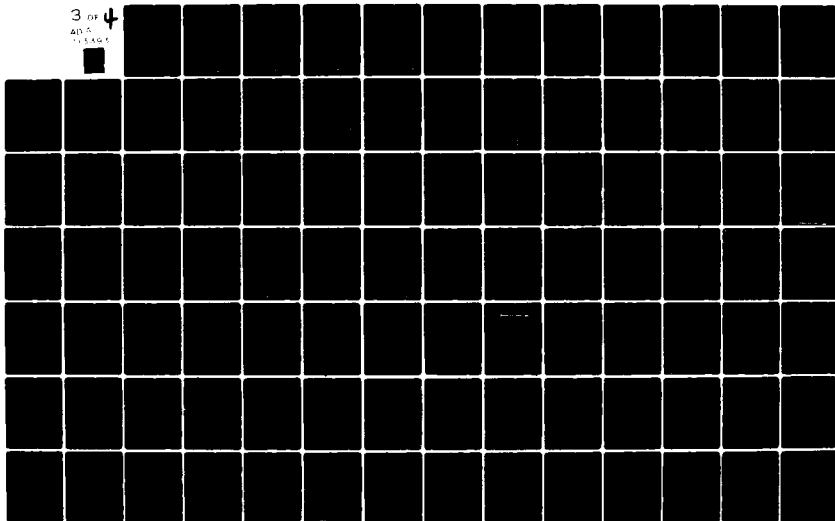
F/6 13/2

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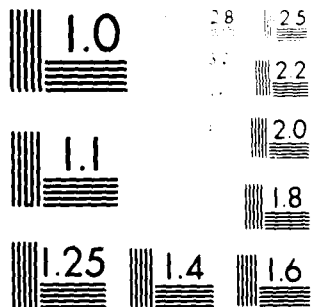
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3 OF 4
AD-A
11-110-1

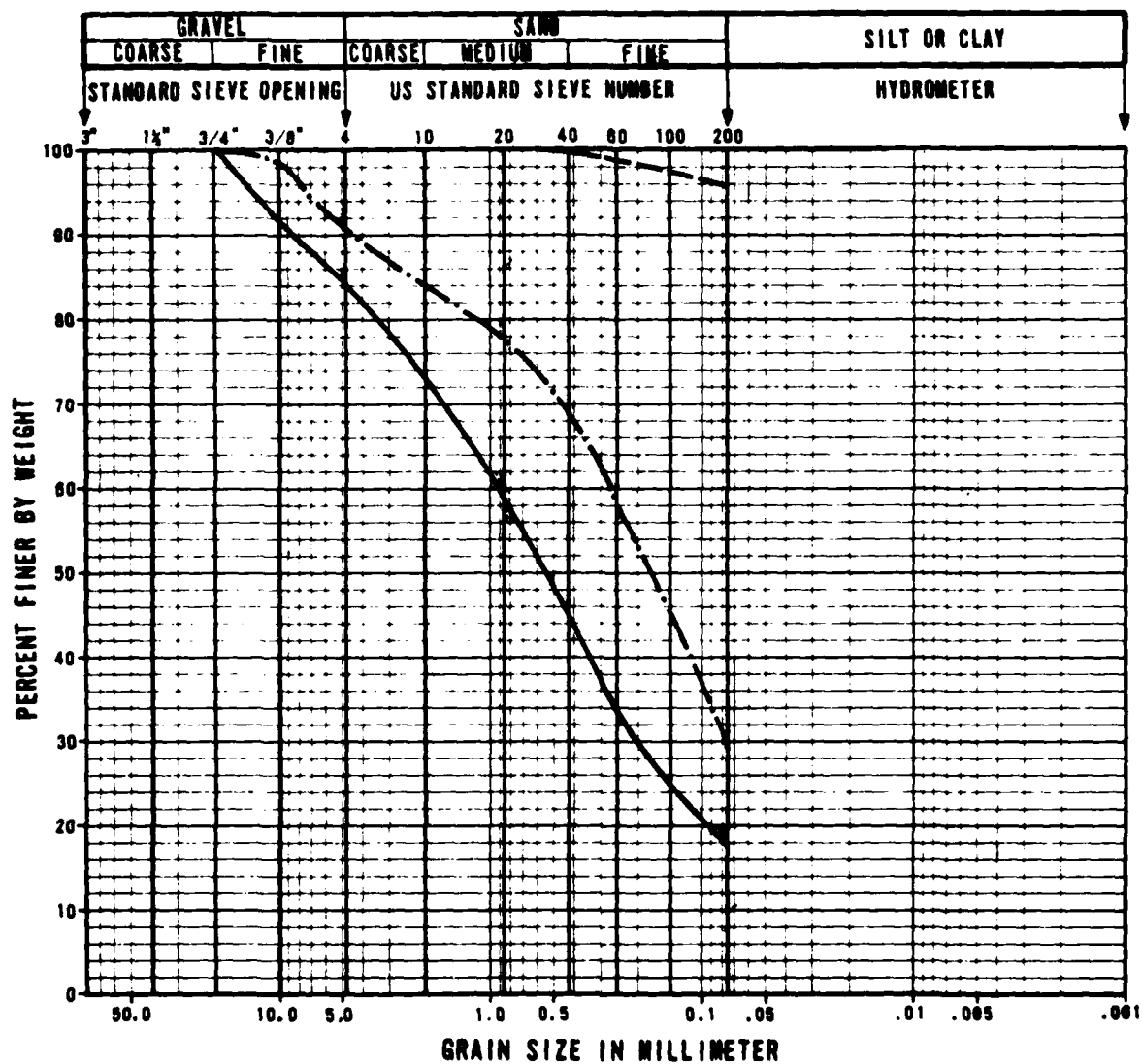


3 3 9 3



Resolution Test Chart

FN-TR-27-WA-II



FN-TR-27-WA-II

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
A	SM	17						9.7	125.0	2003	11.1	97.8	119
									117.5	1882	9.7	91.9	35
						127.8	2047		111.5	1786	9.9	87.3	12
B	CL-ML	52	25	4	2.69			12.7	111.5	1786	13.0	91.8	21
									106.0	1698	12.7	87.3	13
						121.4	1945		94.6	1515	13.0	77.9	4
C	CL	59	33	15				14.9	106.7	1757	15.2	94.2	4
									100.9	1616	15.1	86.7	3
						116.4	1865		88.2	1413	15.2	75.8	1
D	SW-SM	8						9.1	126.6	2028	9.0	96.7	73
									120.1	1924	9.5	91.7	42
						131.0	2099		113.5	1818	9.3	86.6	9

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-8-6
1 OF 4

TESTED NATIONAL INC.

24 MAR 81

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COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
E	SC	40	29	11	2.66	124.5	1994	11.4	114.5	1834	11.5	91.9	4
									106.6	1708	11.6	85.7	2
									97.5	1562	11.5	78.3	2
F	GM	17				133.5	2139	8.8	130.9	2097	8.4	98.0	47
									127.3	2039	7.2	95.3	22
									117.4	1881	7.3	87.9	3
G	SP	3				133.6	2140	8.5	120.5	1930	8.4	90.2	30
									117.1	1876	8.1	87.7	30
	ML	86		NP	2.64	109.5	1754	17.4	98.9	1586	18.0	90.3	10
									101.2	1621	17.7	92.4	7
									89.0	1424	17.4	81.2	4

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-8-6
2 OF 4

FURRO NATIONAL, INC.

24 MAR 81

USAF -08

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
I	SM	27				118.5	1898	14.0	108.6	1738	13.4	91.6	32
									99.7	1596	14.8	84.1	11
									91.2	1461	13.8	77.0	3
J	SM	25				125.7	2014	11.0	116.1	1860	11.1	92.4	34
									108.2	1733	11.3	86.1	8
									101.1	1620	11.5	80.4	3
K	CL-ML	90	28	6		114.6	1836	15.7	106.1	1700	16.0	92.6	11
									100.4	1608	16.0	87.6	7
									88.0	1410	16.0	76.8	3
L	SM	18			2.69	124.9	2001	10.6	118.8	1903	11.0	95.1	68
									109.6	1756	10.6	87.8	23
									102.0	1634	10.5	81.7	4

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-8-6
3 OF 4

TUSCO NATIONAL INC.

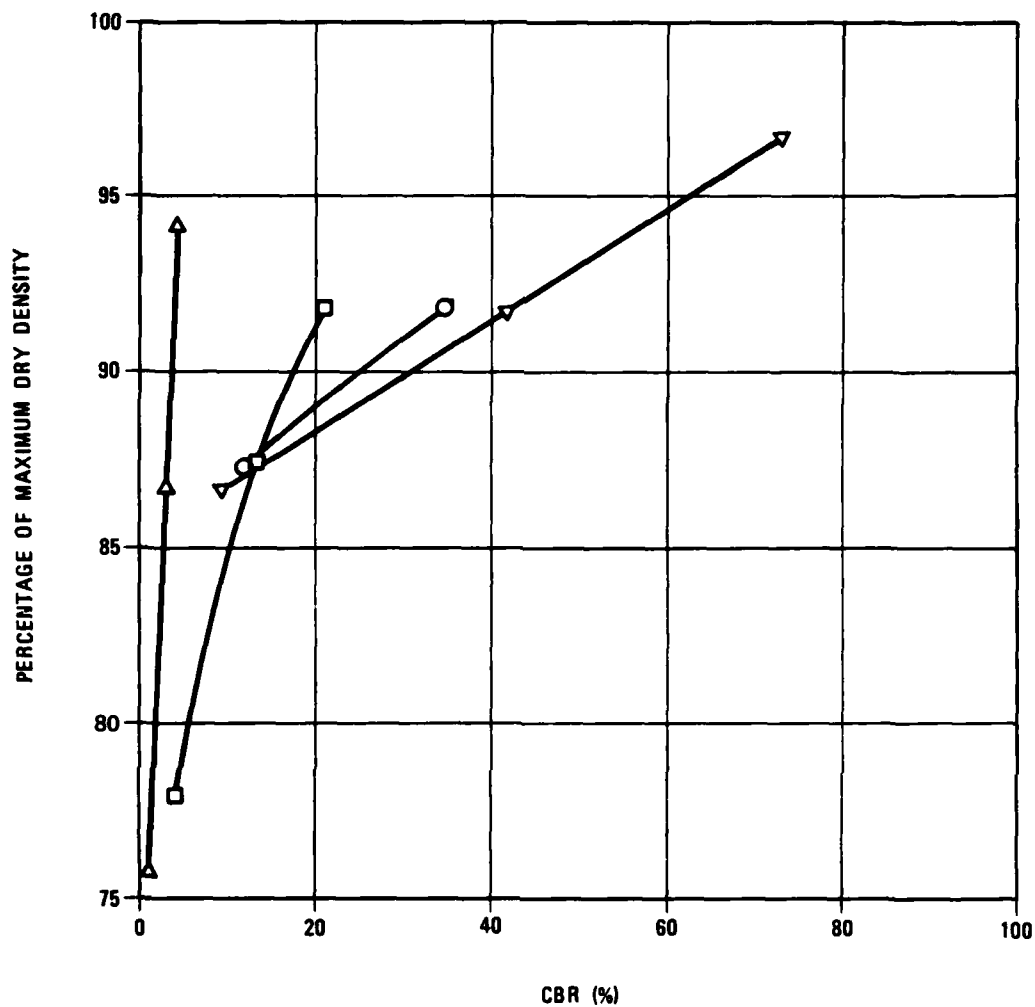
COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
M	SM	13				121.8	1951	12.0	112.5	1802	12.2	92.3	27
									103.6	1660	12.1	85.1	7
									96.6	1548	12.6	79.3	3
N	SM	18				125.8	2015	10.5	117.5	1882	10.1	93.4	37
									110.8	1775	10.6	88.1	12
									109.2	1749	9.3	86.8	6
O	ML	95	47	9		102.3	1639	22.0	89.9	1440	23.2	87.9	7
									86.2	1381	23.1	84.3	5
									81.5	1306	22.7	79.6	4
P	SM	29				126.7	2030	10.0	114.8	1837	10.5	90.6	18
									112.6	1804	9.9	88.9	10
									101.8	1631	9.8	80.4	1

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

TABLE
II-8-6
4 OF 4

FLURO NATIONAL INC.



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	A	SM
□	B	CL-ML
△	C	CL
▽	D	SW-SM

CALIFORNIA BEARING RATIO (CBR) CURVES
WAH WAH VALLEY, UTAH

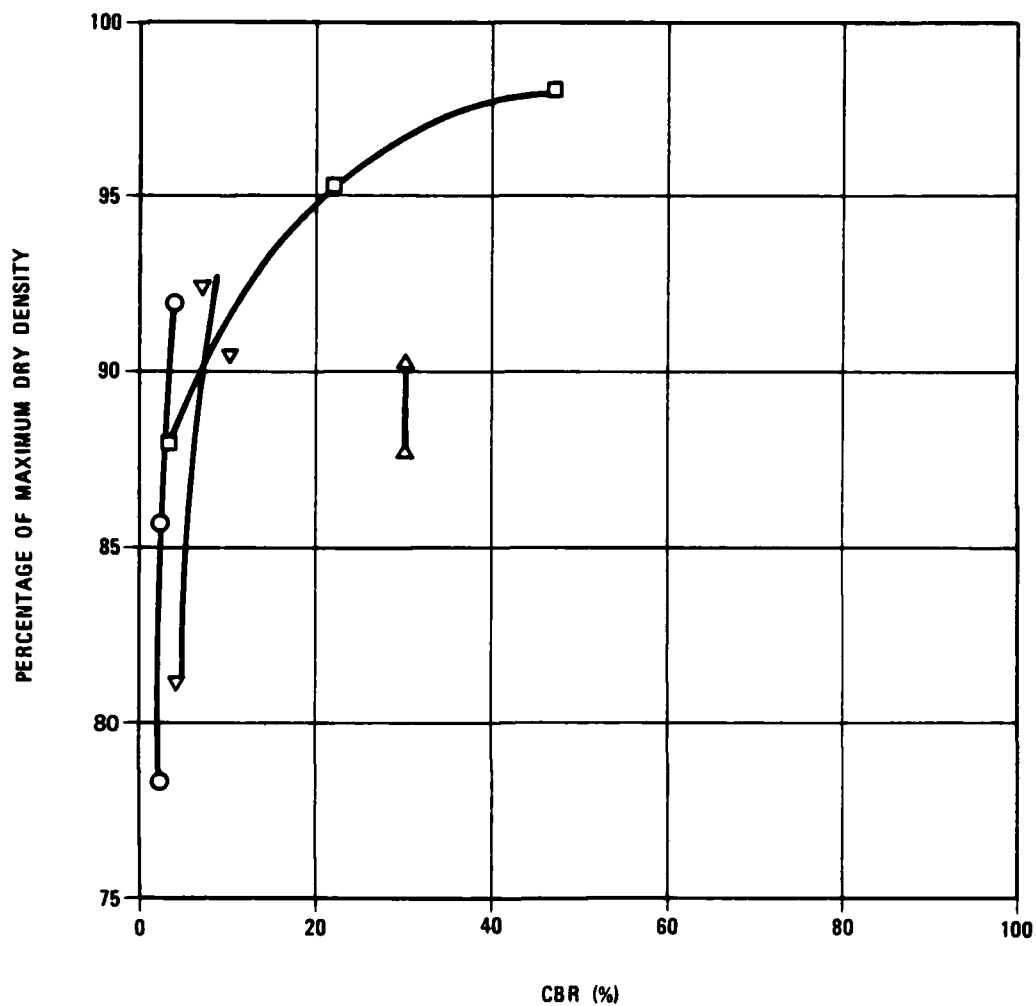
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-8-3
1 OF 4

FUGRO NATIONAL, INC.

24 MAR 81

FN-TR-27-WA-II



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
O	E	SC
□	F	GM
Δ	G	SP
▽	H	ML

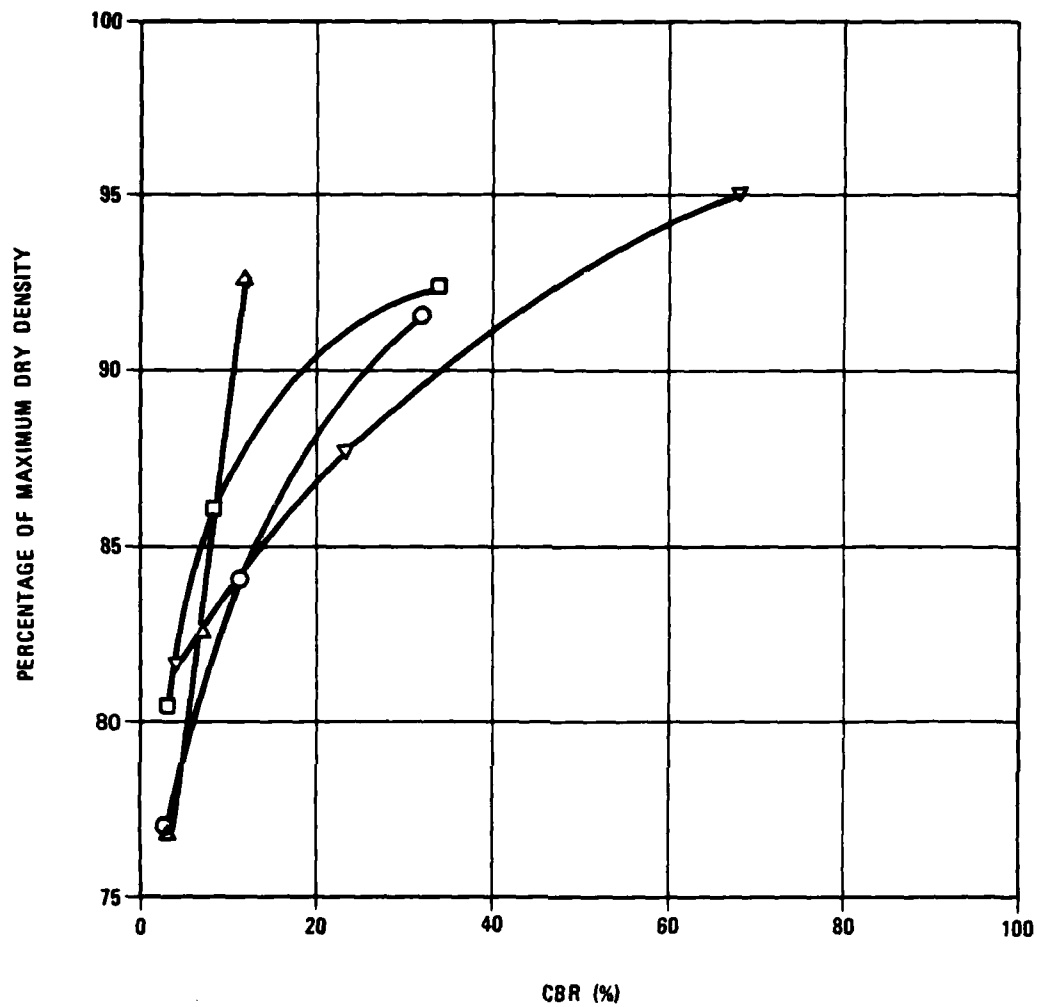
CALIFORNIA BEARING RATIO (CBR) CURVES
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-8-3
2 OF 4

FUGRO NATIONAL, INC.

24 MAR 81



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	I	SM
□	J	SM
△	K	CL-ML
▽	L	SM

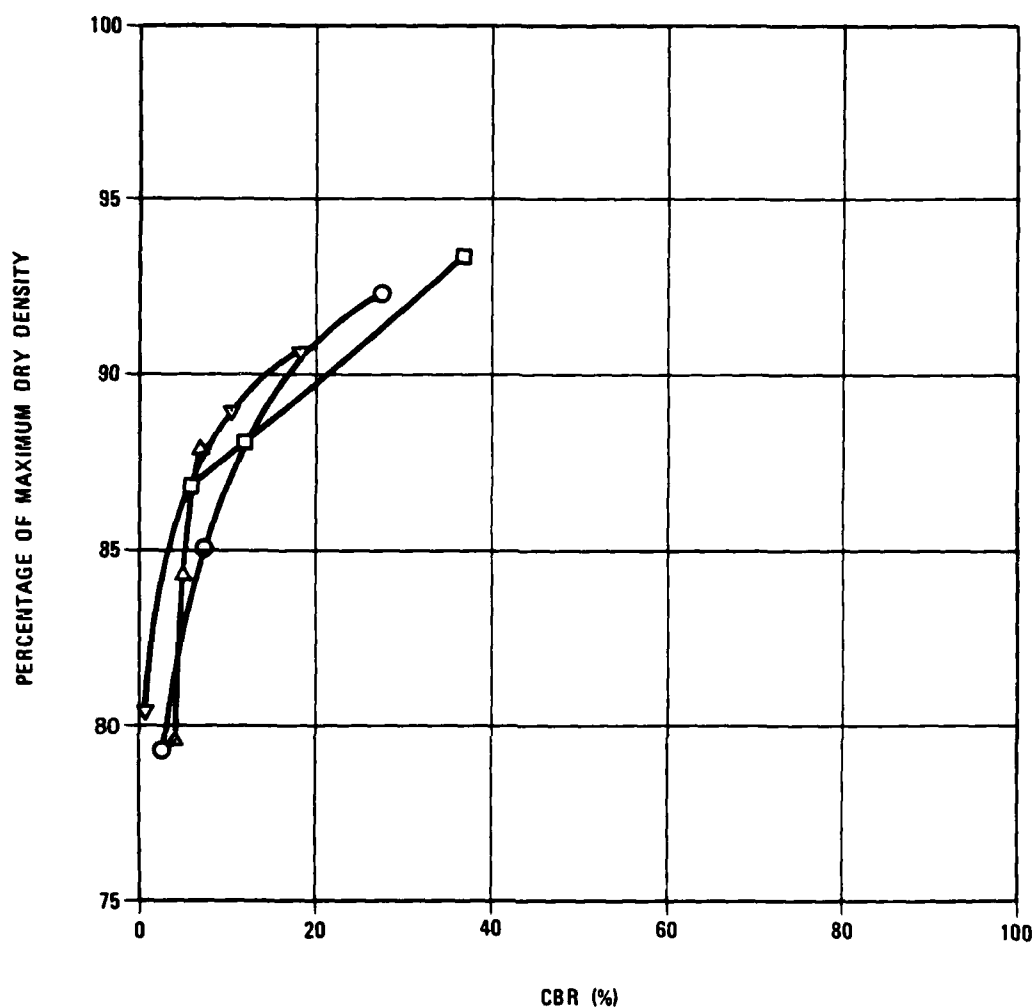
CALIFORNIA BEARING RATIO (CBR) CURVES
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-8-3
3 OF 4

FUGRO NATIONAL, INC.

24 MAR 81



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	M	SM
□	N	SM
△	O	ML
▽	P	SM

CALIFORNIA BEARING RATIO (CBR) CURVES
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-8-3
4 OF 4

FUGRO NATIONAL, INC.

9.0 FIELD CALIFORNIA BEARING RATIO
(CBR) TEST RESULTS

Explanation: The results of the field CBR tests are tabulated in this section. Explanations of the column headings in Table II-9-1 follow.

A. Designations - Field CBR tests are identified as follows:

WA - F-1

WA - abbreviation for the valley (e.g., WA-Wah Wah)

F - abbreviation for field CBR

1 - number of activity

B. Ground Surface Elevation - Indicated elevations on the logs are estimated from topographic maps of the study area within an accuracy of half the contour interval.

C. Surficial Geologic Unit - Indicates the surficial geologic unit in which the activity is located.

D. Depth - Indicates depth interval for which soil description is given.

E. USCS - Unified Soil Classification Symbol; see Table II-5-1 of Section 5.0, "Boring Logs," for details of USCS.

F. Grain Size Distribution and Plasticity - These are from results of laboratory tests. See Section 5.0, "Boring Logs," for explanation.

G. In Situ Dry Unit Weight - These are from results of field tests performed in accordance with the American Society for

Testing and Materials (ASTM) procedure D 1556-64, "Test for Density of Soil in Place by the Sand-Cone Method."

- H. Moisture Content - These are from results of laboratory tests performed in accordance with ASTM procedure D 2216-71, "Laboratory Determination of Moisture Content of Soil."
- I. Estimated Percent of Maximum Dry Density - This indicates the ratio (as a percentage) of the in situ dry unit weight obtained in the laboratory from ASTM D 1557-70, "Moisture-Density Relations of Soils Using 10-pound (4.5-kg) Hammer and 18-inch (457-mm) Drop" at that site or from a compatible site with matching grain size distribution.
- J. Average Field CBR - The CBR is the ratio of the resistance to penetration developed by a soil to that developed by a standard crushed-rock base material. The procedures used for calculating the field CBR values are as outlined in the U.S. Army Corps of Engineers Technical Manual (TM) 5-30, pp. 2-86 to 2-96.

[illegible]

ESTIMATED PERCENT OF MAXIMUM DRY DENSITY	AVERAGE FIELD CBR (%)	REMARKS
71	8	Maximum dry density from (WA T 3)
61	5	Maximum dry density from (WA F 8)
67	6	
57	8	Cementation
66	8	Maximum dry density from (WA P 4)
82	8	Soil inconsistent throughout 2.0' level
82		No field CBR performed, maximum dry density from (WAT 10)
75	6	
70	7	Maximum dry density from (WA P 4)
75	8	Large gravel in field density hole
76	4	
69	15	Maximum dry density from (WA F 8)
64	8	
65	8	Maximum dry density from (WA T 4)
77		No field CBR performed, maximum dry density from (WA F 8)
73	15	Maximum dry density from (WA P 16)
67	7	
68	9	Maximum dry density from (WA T 4)
58	5	
71	6	Maximum dry density from (WA P 4)
68	9	Maximum dry density from (WA F 3)
63	10	Maximum dry density from (WA T 15)
58	8	
56	5	
58	10	
77	4	
77	8	

FIELD CBR TEST RESULTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

TABLE
II-9-1

FUGRO NATIONAL, INC.

AFV-22

10.0 CONE PENETROMETER TEST RESULTS

Explanation: The drawings in this section show the results of the cone penetrometer tests. The terms used in the drawings are defined below.

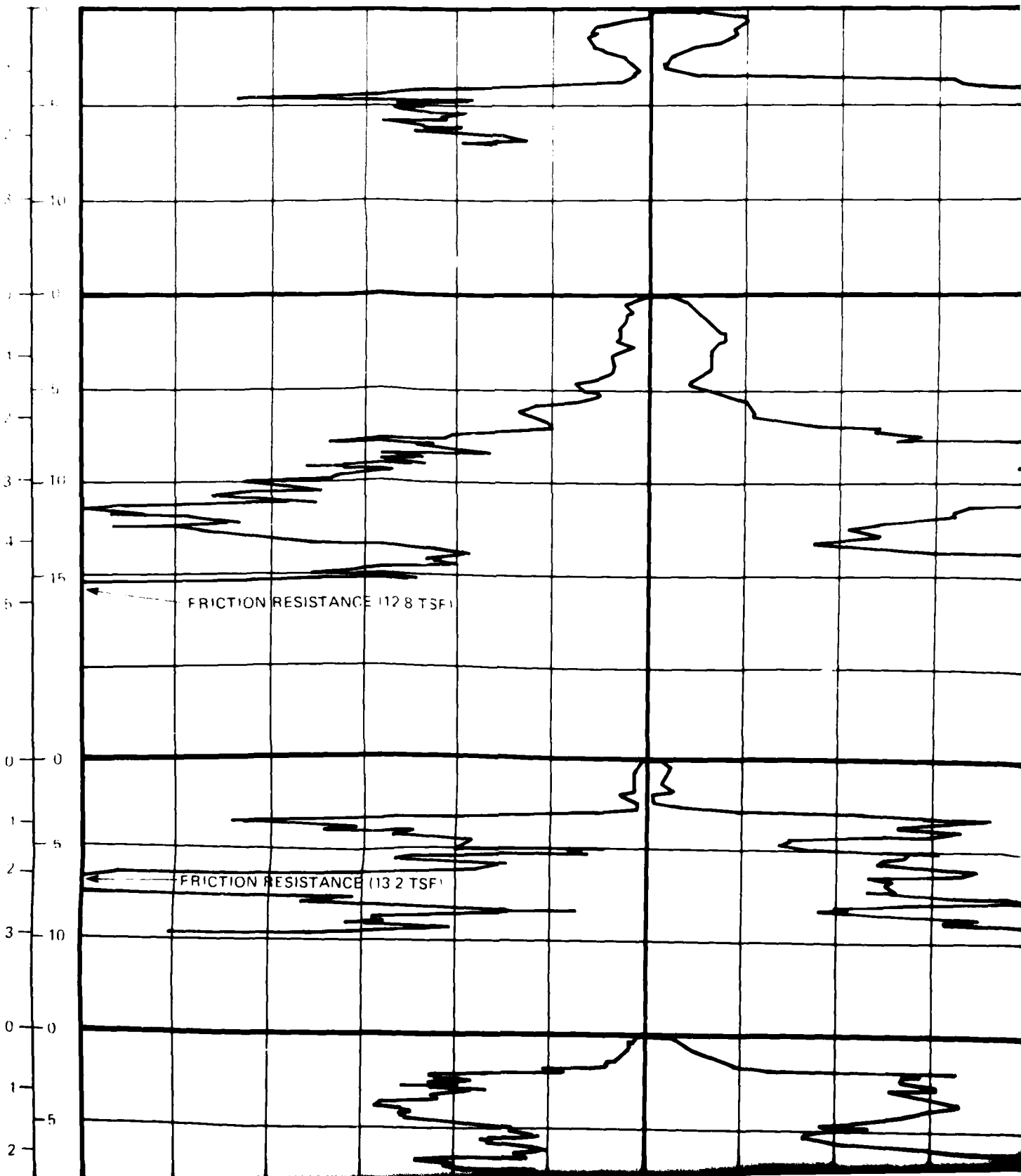
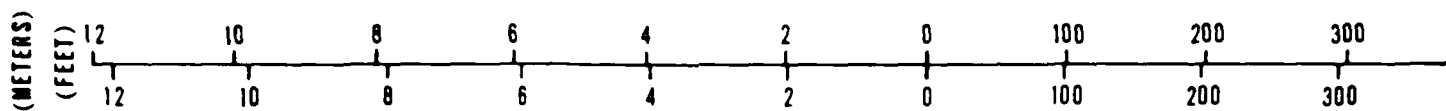
- A. Depth - Corresponds to depth below ground surface.
- B. Friction Resistance - The resistance to penetration developed by the friction sleeve, equal to the vertical force applied to the sleeve divided by its surface area. This resistance is the sum of friction and adhesion.
- C. Cone Resistance - The resistance to penetration developed by the cone, equal to the vertical force applied to the cone divided by its horizontally projected area.
- D. Friction Ratio - The ratio of friction resistance to cone resistance.
- E. Designation - Each cone penetrometer test is identified by a number: for example C-1.
 - C - abbreviation for the CPT
 - 1 - number of the test
- F. Surface Elevation - Indicated elevations on the drawings are estimated from topographic maps of the study area and are accurate within one-half the contour interval.
- G. Surficial Geologic Unit - Indicates the surficial geologic unit in which the test was located.

H. Soil Column - A graphical presentation of the soil type versus depth at each cone penetrometer test location. The Unified Soil Classification Symbol for each different soil type is listed immediately to the left of the soil column. Immediately below the soil column, the activity number for the corresponding boring, trench, or test pit, or surficial soil sample at each CPT location is given.

FRICTION RESISTANCE

C0

DEPTH



CONE RESISTANCE

FRICTION

300 400 500 600 700 800 900 (kg/cm²)
 300 400 500 600 700 800 900 (tsf)

SOIL
COLUMN

0 2 4

CONE RESISTANCE (969 TSF)

CONE RESISTANCE (941 TSF)

C 1 SURFACE ELEVATION: 4835' (1474m)
 SURFICIAL GEOLOGIC UNIT: A4, A5v

C 2 SURFACE ELEVATION: 4920' (1500m)
 SURFICIAL GEOLOGIC UNIT: A4v, A5v

C 3 SURFACE ELEVATION: 4955' (1510m)
 SURFICIAL GEOLOGIC UNIT: A5v, A4v

CONE RESISTANCE (938 TSF)

SP
SM

CS 1

SM

P 1

SM

GP
GC

SM

T-1

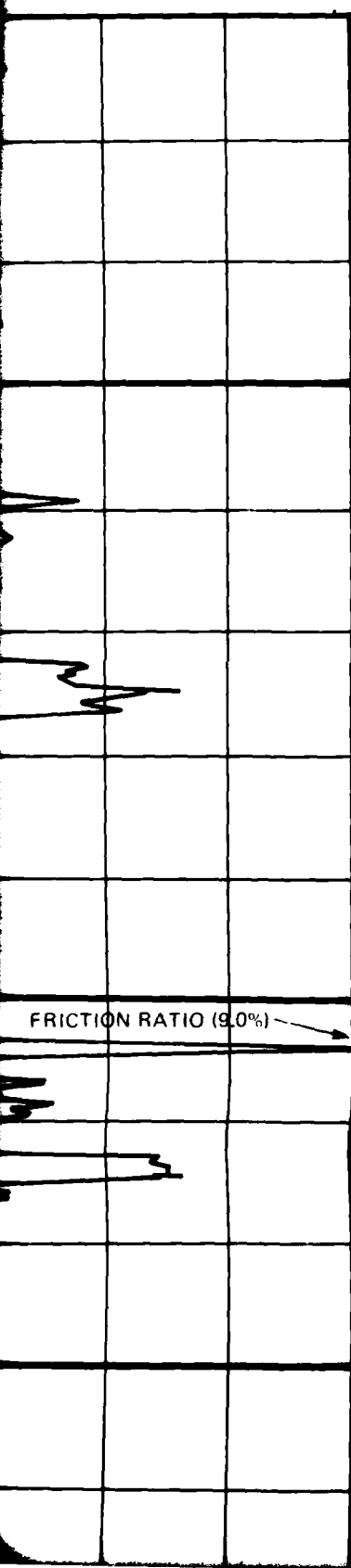
SM

GP
GM

FRICTION

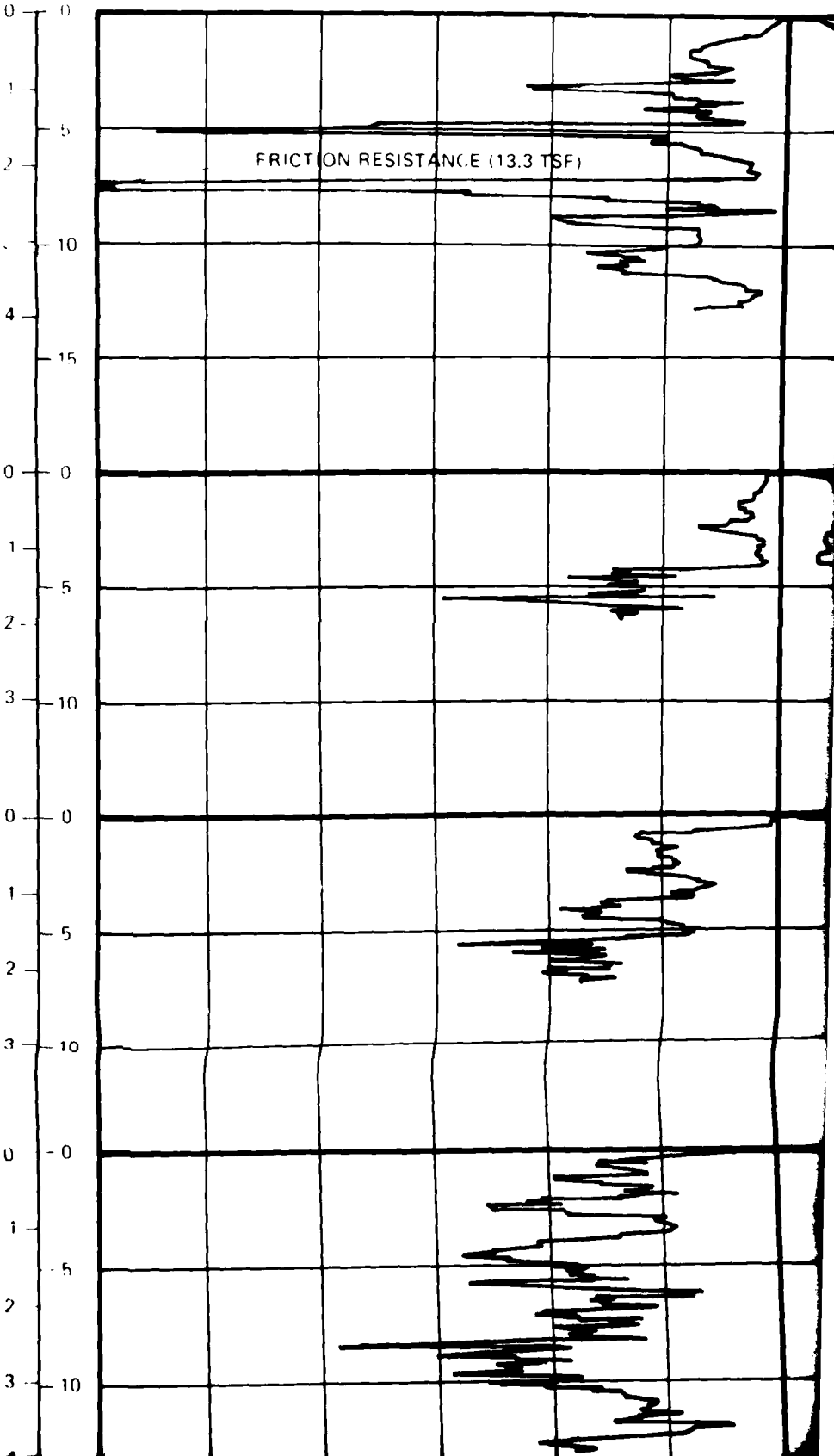
RICTION RATIO

4 6 8 (%)



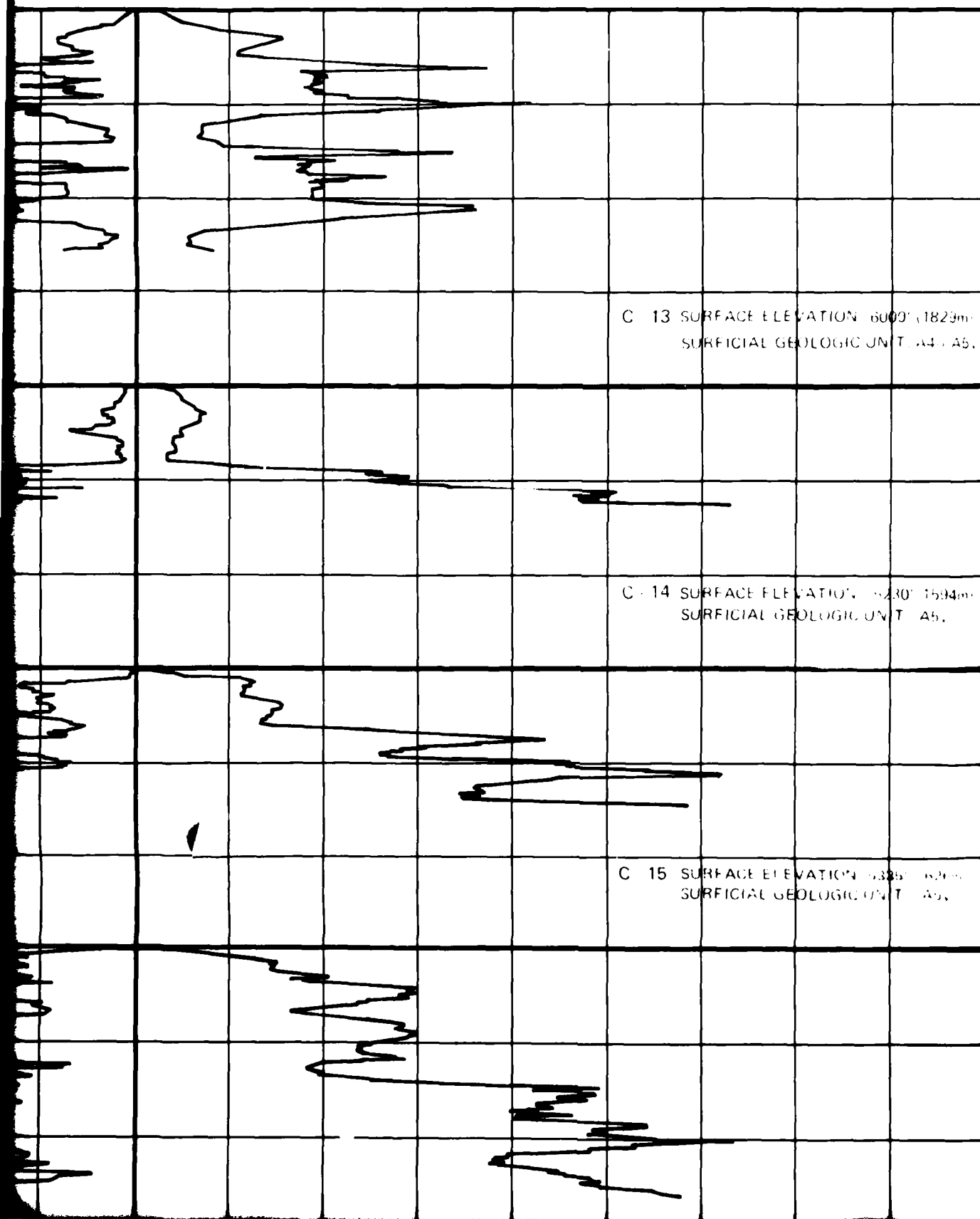
FRICION RESISTANCE

DEPTH (METERS) (FEET) 12 10 8 6 4 2 0



CONE RESISTANCE

2 0 100 200 300 400 500 600 700 800 900 (kg/cm²)
 2 0 100 200 300 400 500 600 700 800 900 (tsf)



C - 13 SURFACE ELEVATION 6009' (1829m)
 SURFICIAL GEOLOGIC UNIT A5.

C - 14 SURFACE ELEVATION 6230' (1904m)
 SURFICIAL GEOLOGIC UNIT A5.

C - 15 SURFACE ELEVATION 6325' (1928m)
 SURFICIAL GEOLOGIC UNIT A5.

SM

SM

SM

SP

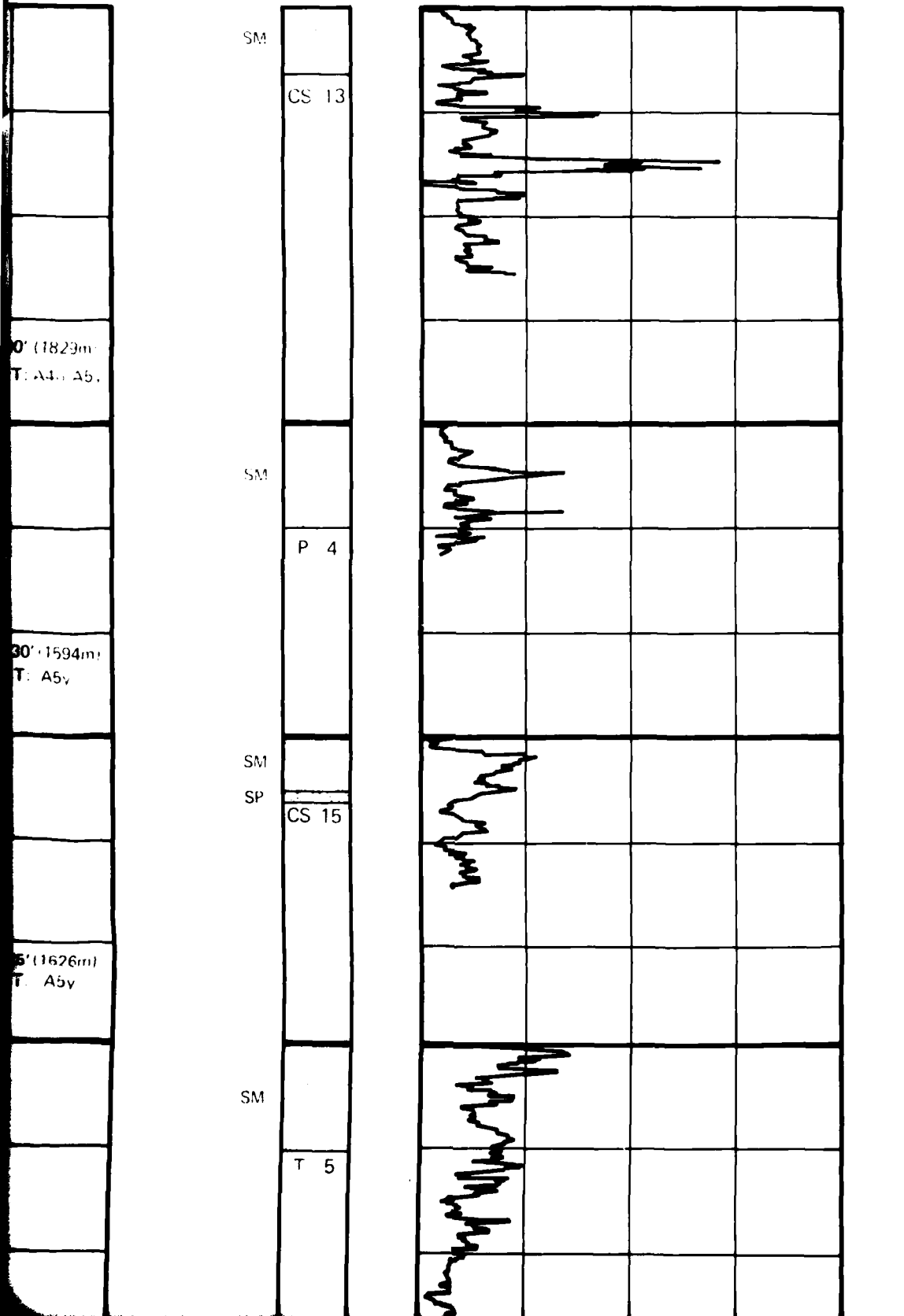
SM

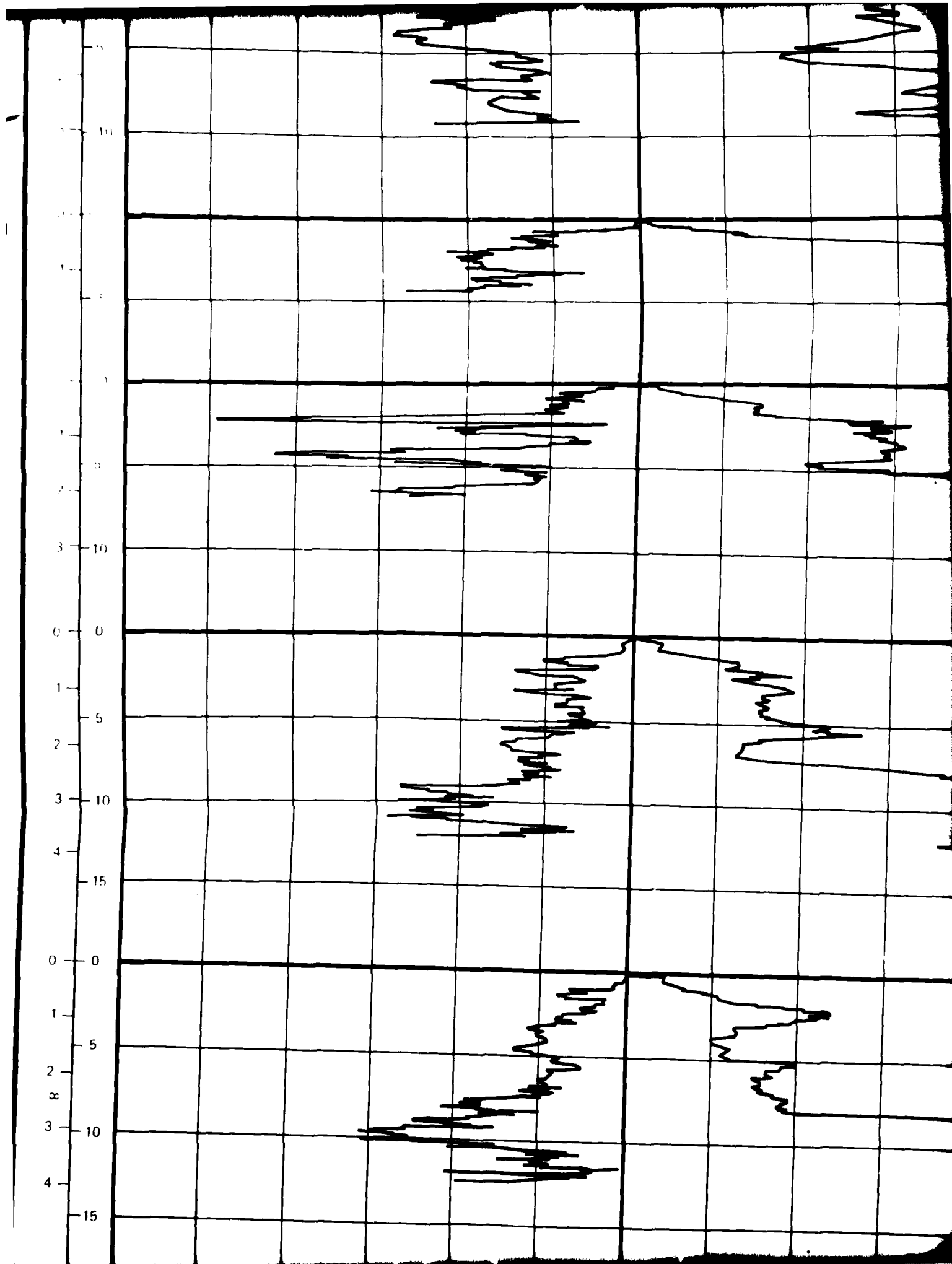
FRICTION RATIO

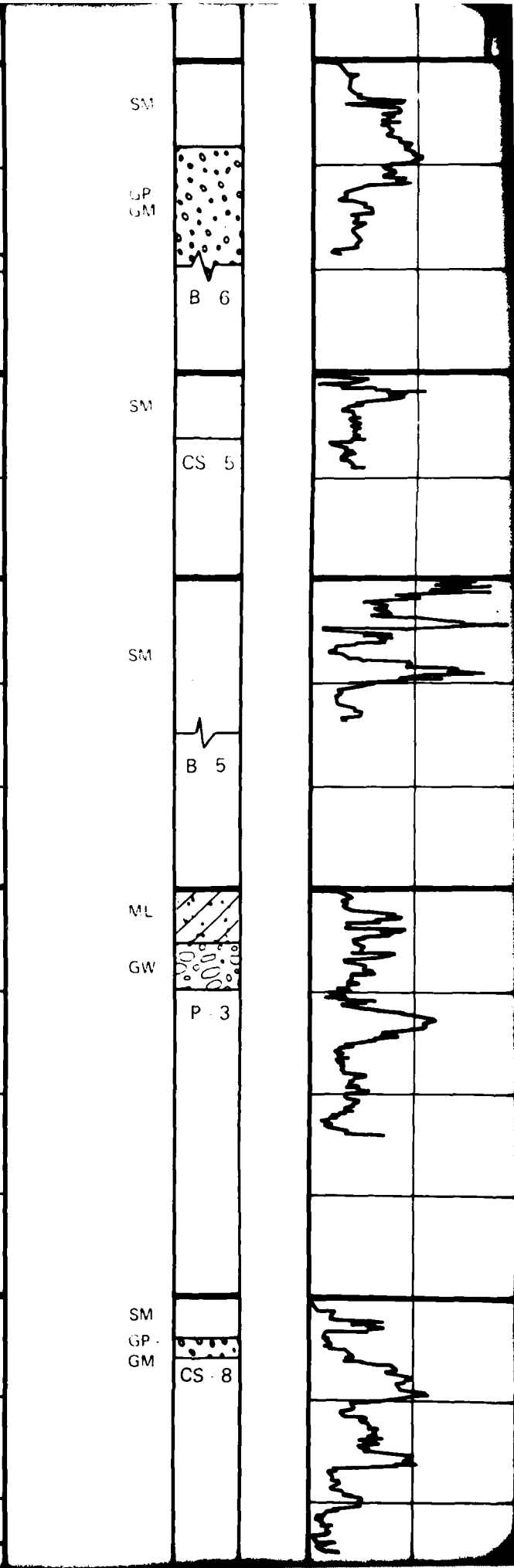
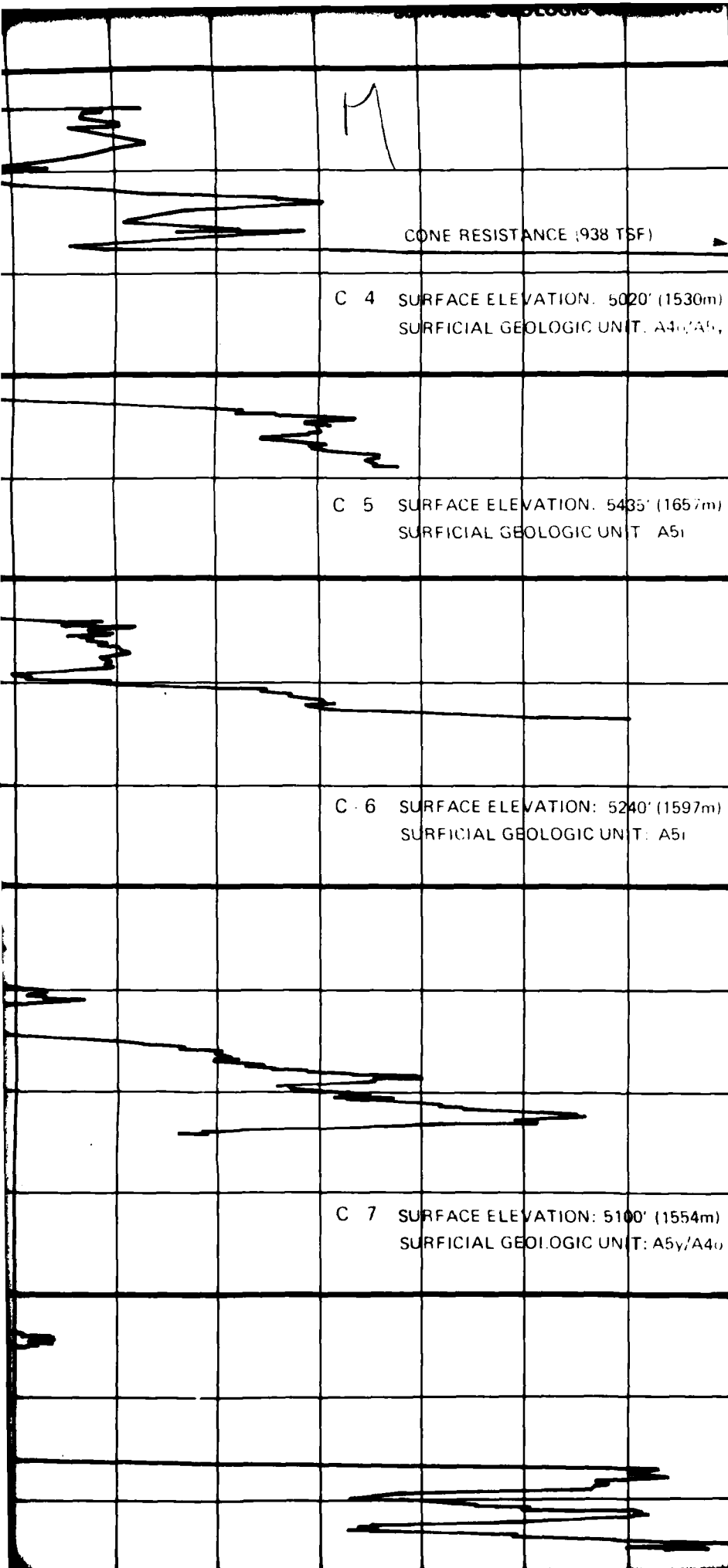
800 900 (kg/cm²)
 900 (tsf)

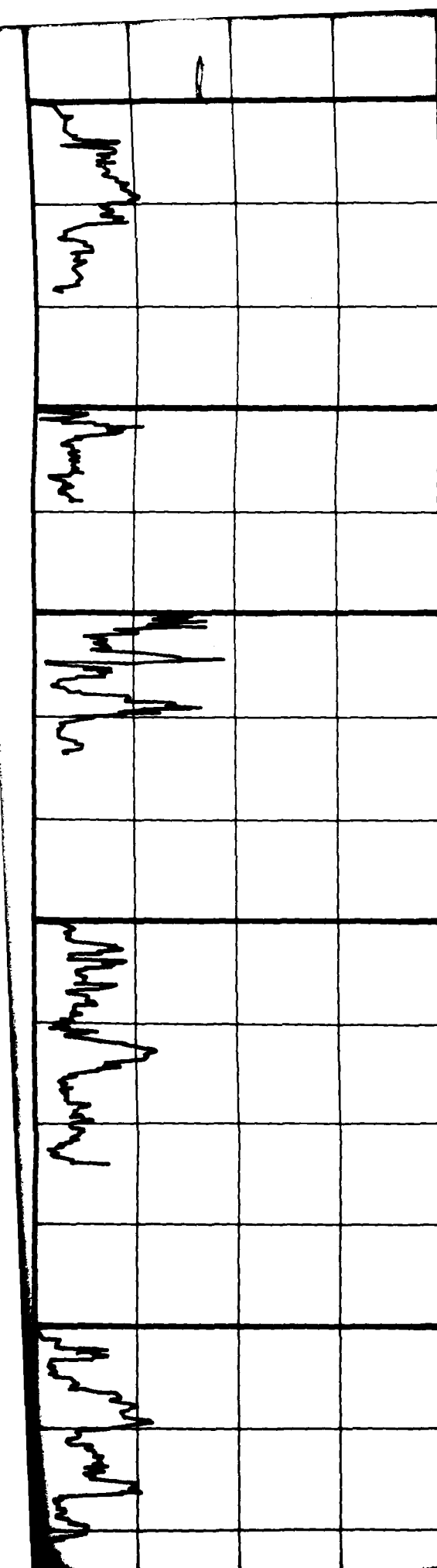
SOIL
COLUMN

0 2 4 6 8 (%)

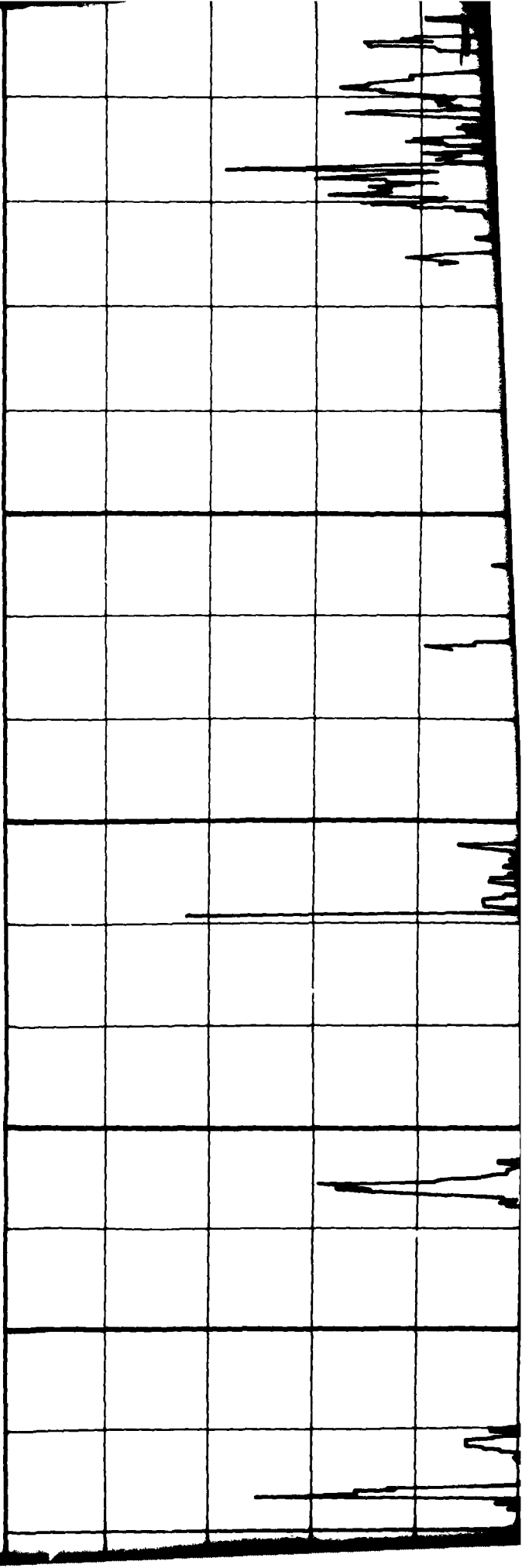
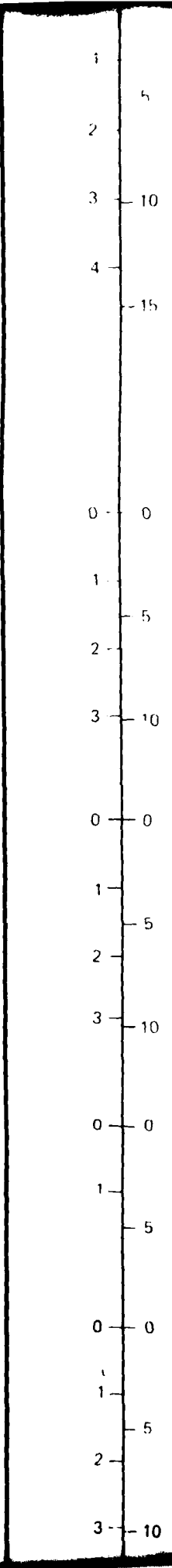


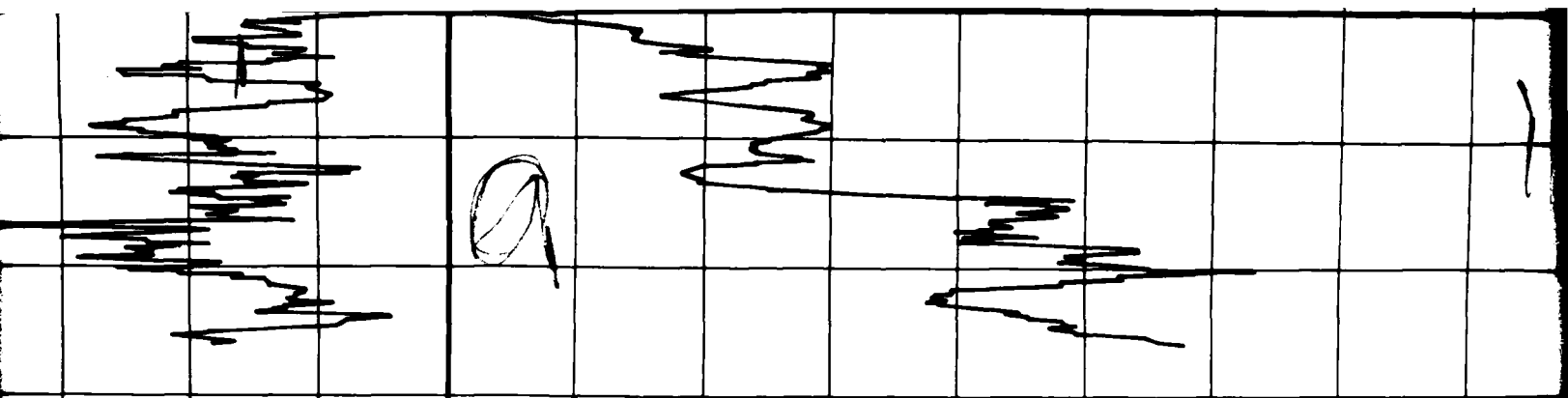






8





C 16 SURFACE ELEVATION: 5470' (1667)
SURFICIAL GEOLOGIC UNIT A5v



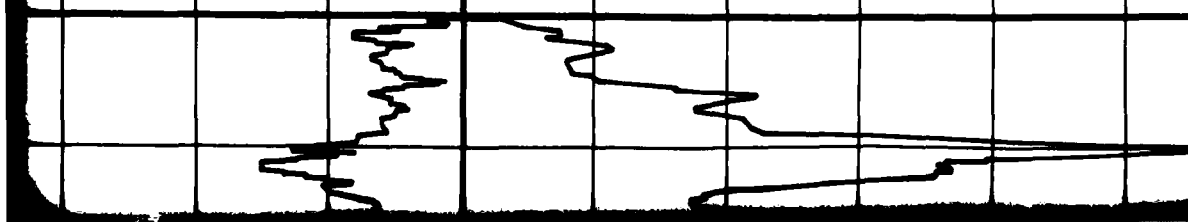
C 17 SURFACE ELEVATION: 5300' (1615)
SURFICIAL GEOLOGIC UNIT A5v



C 18 SURFACE ELEVATION: 5395' (1644)
SURFICIAL GEOLOGIC UNIT A5v



C 19 SURFACE ELEVATION: 5510' (1678)
SURFICIAL GEOLOGIC UNIT A5v



FACE ELEVATION: 5470' (1667m)
FICIAL GEOLOGIC UNIT: A5,

FACE ELEVATION: 5300' (1615m)
FICIAL GEOLOGIC UNIT: A5,

FACE ELEVATION: 5395' (1644m)
FICIAL GEOLOGIC UNIT: A5,

FACE ELEVATION: 5510' (1679m)
FICIAL GEOLOGIC UNIT: A5,

FACE ELEVATION: 5230' (1594m)
FICIAL GEOLOGIC UNIT: A5,

SM

T 5

SM

SP
SY

T 6

SM

CS 18

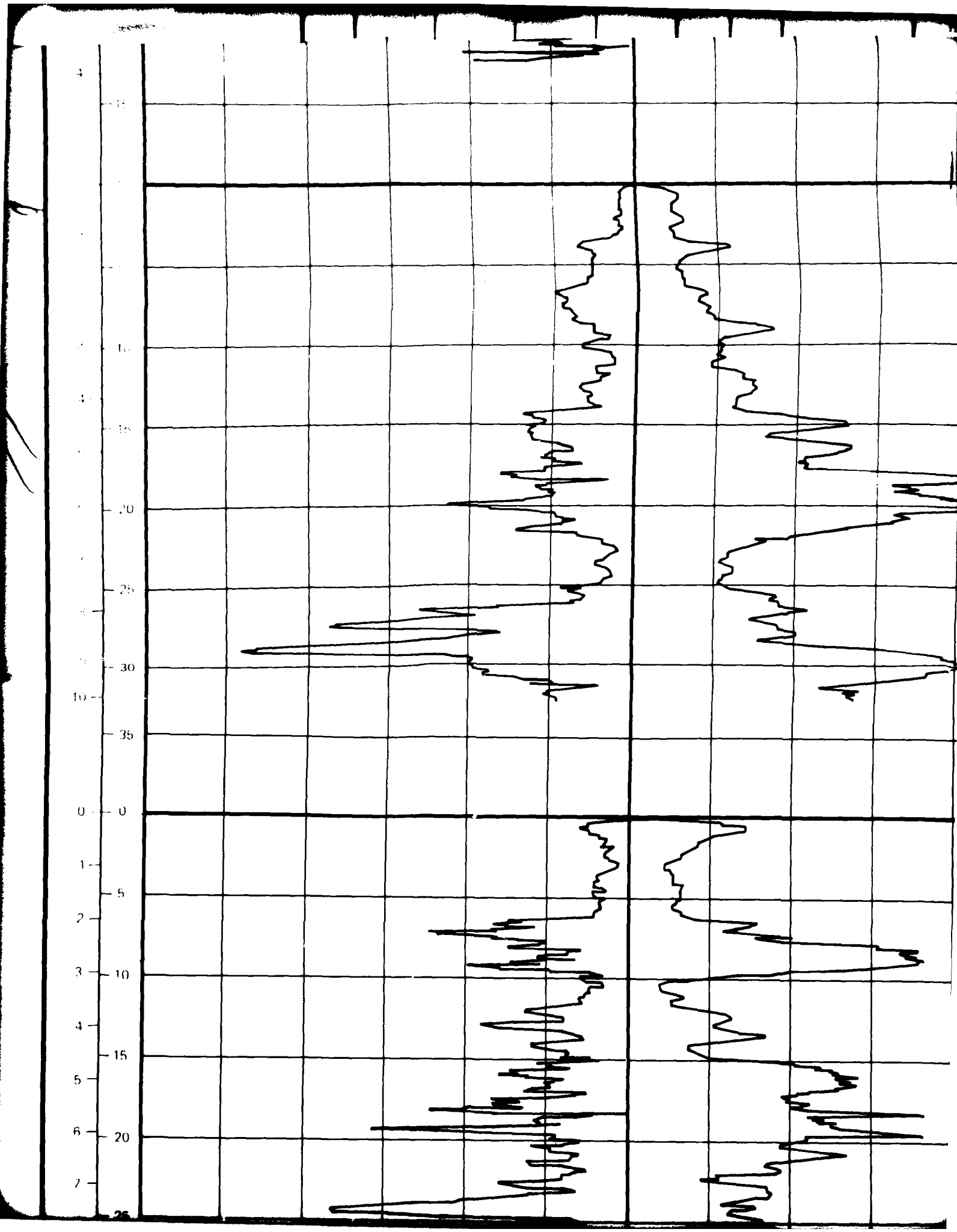
SM

SW

T 7

SM

CS 20



C 8 SURFACE ELEVATION 4960 (1512m)
SURFICIAL GEOLOGIC UNIT A5, A4

12

C 9 SURFACE ELEVATION 4915' (1498m)
SURFICIAL GEOLOGIC UNIT A5, A4

SL
A1

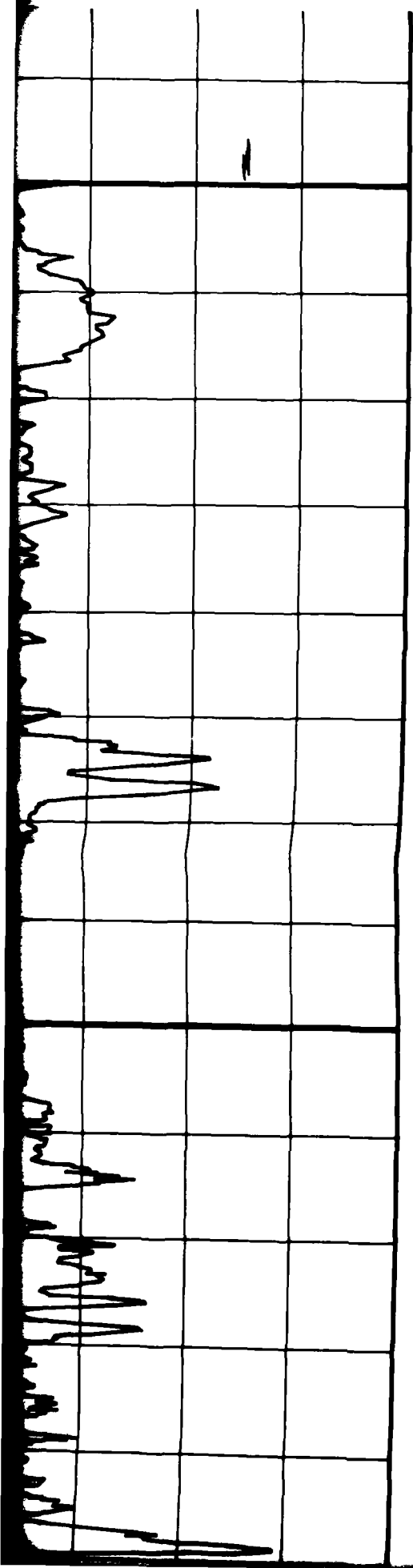
SL

SV

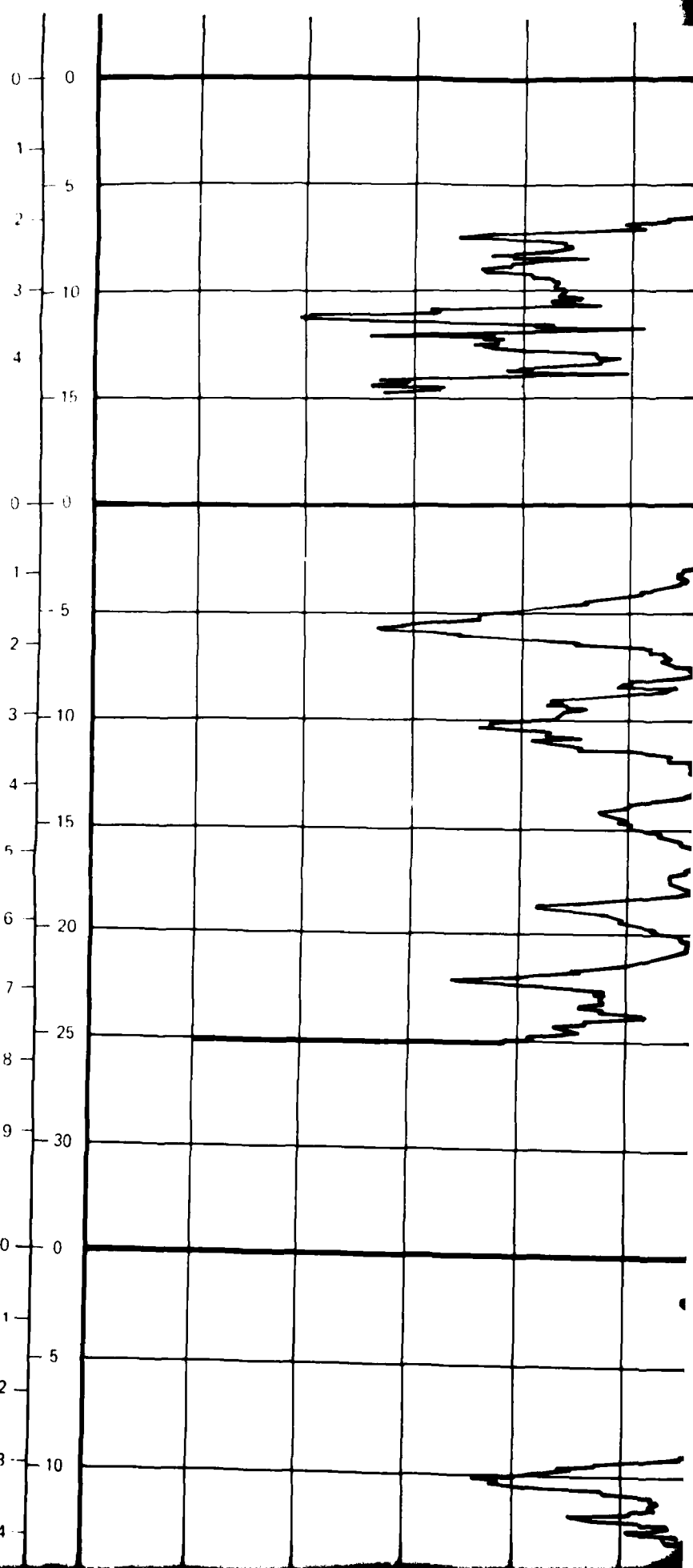
T 3

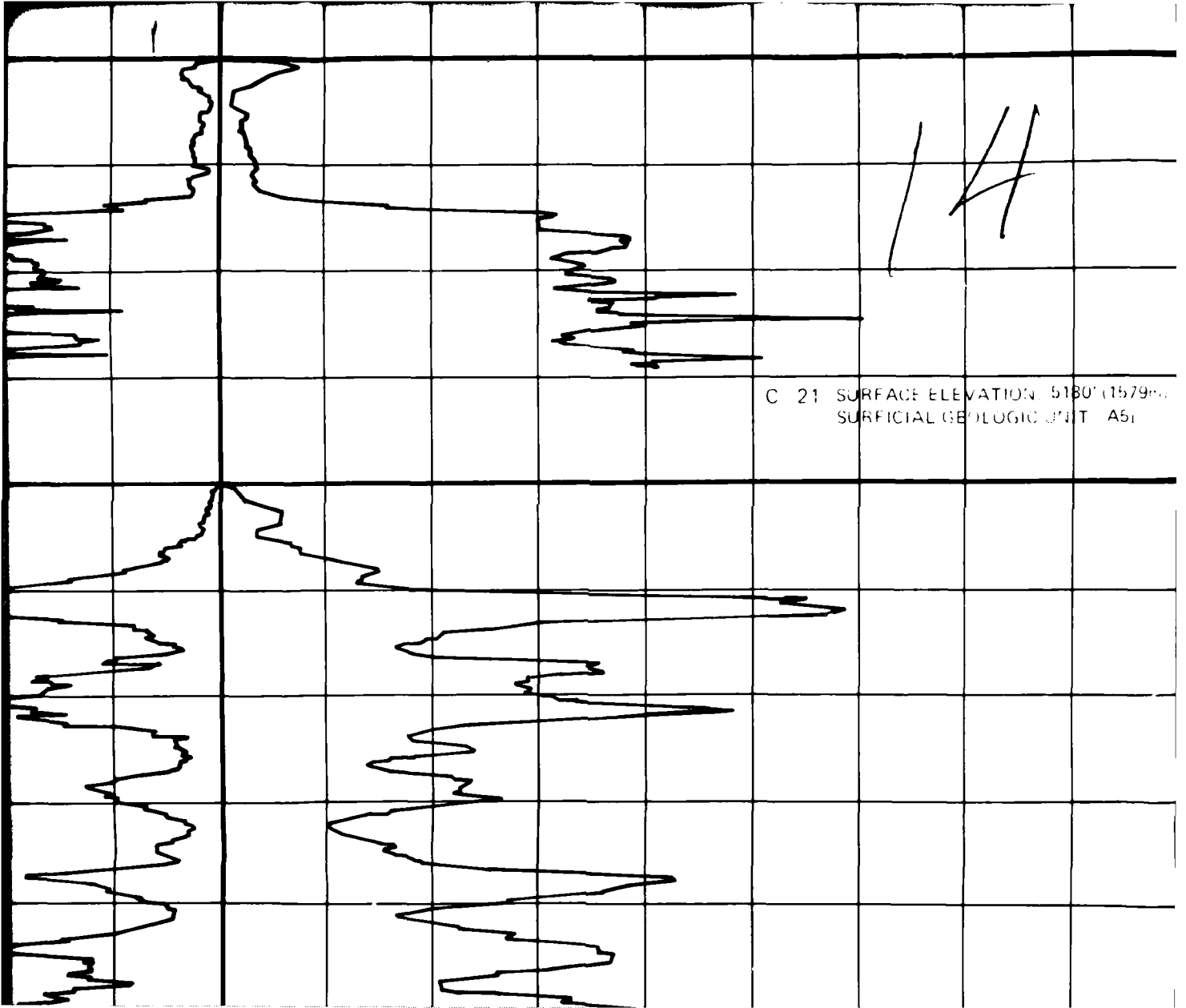
SL

CS 10



12





ML

SP
S⁺

T 8

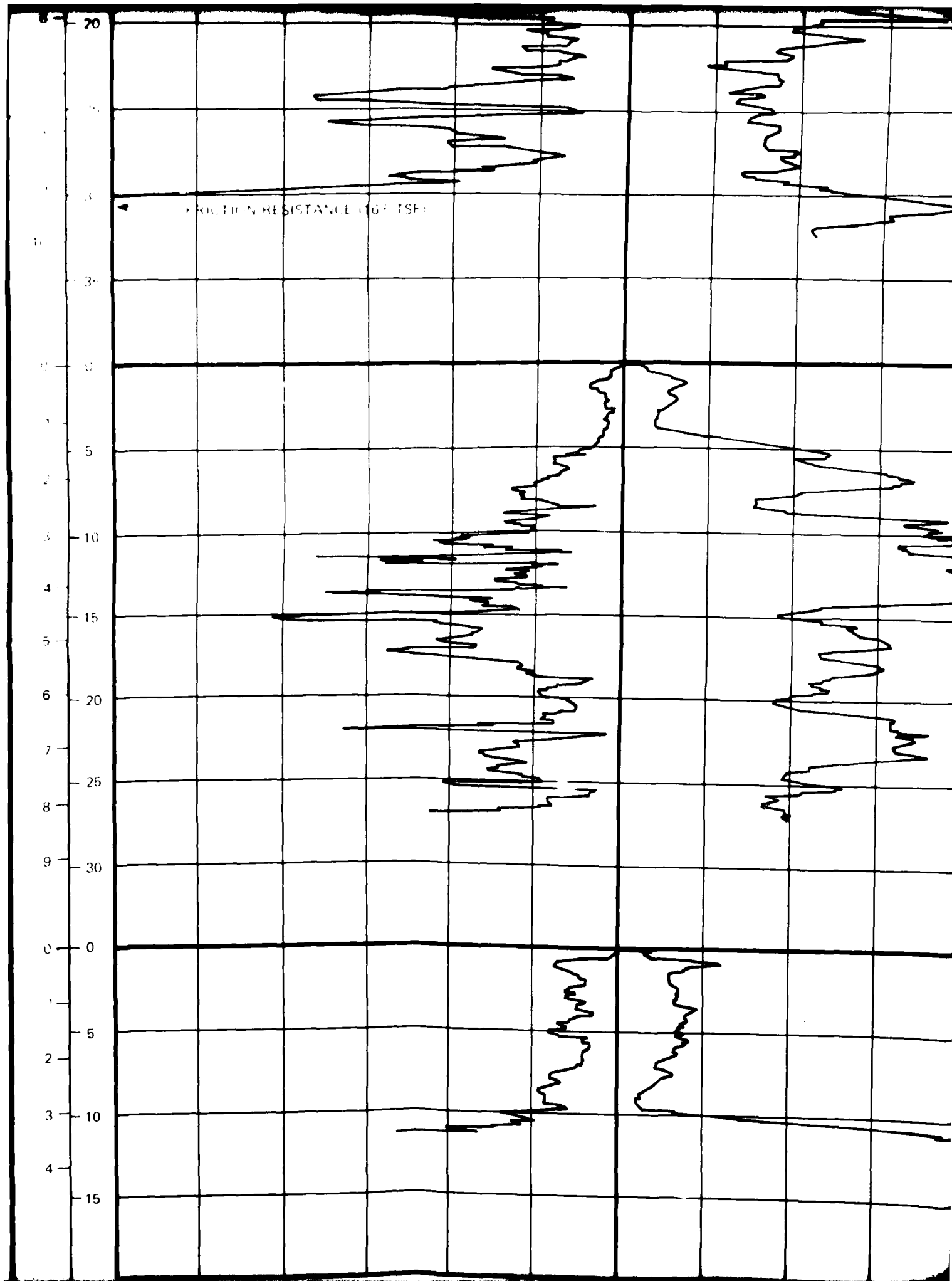
S⁺

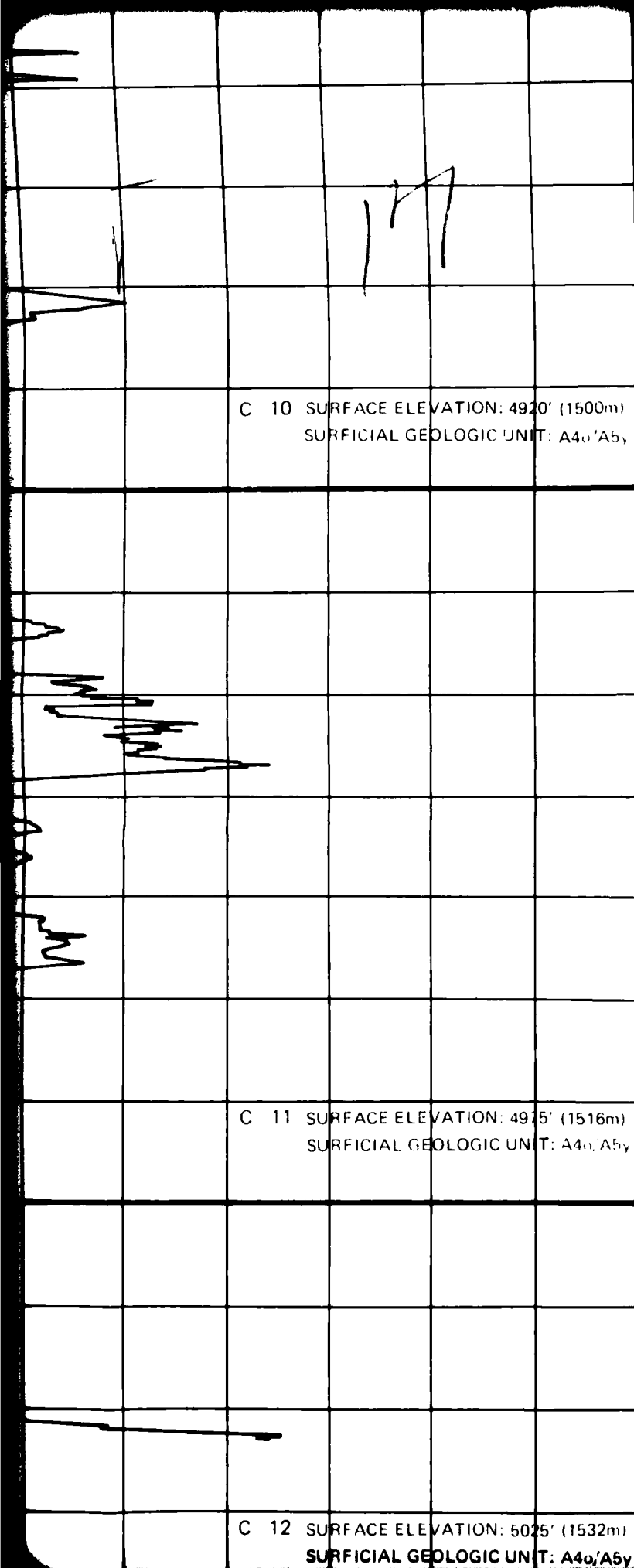
P 5

SM

CS-23

15





—

SC

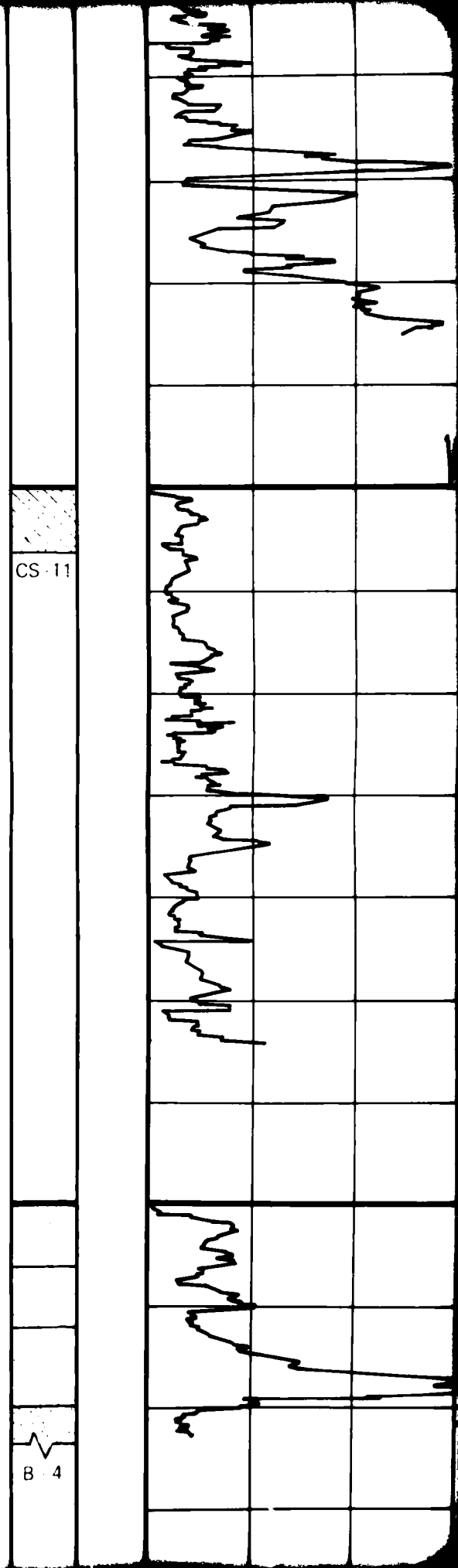
SM

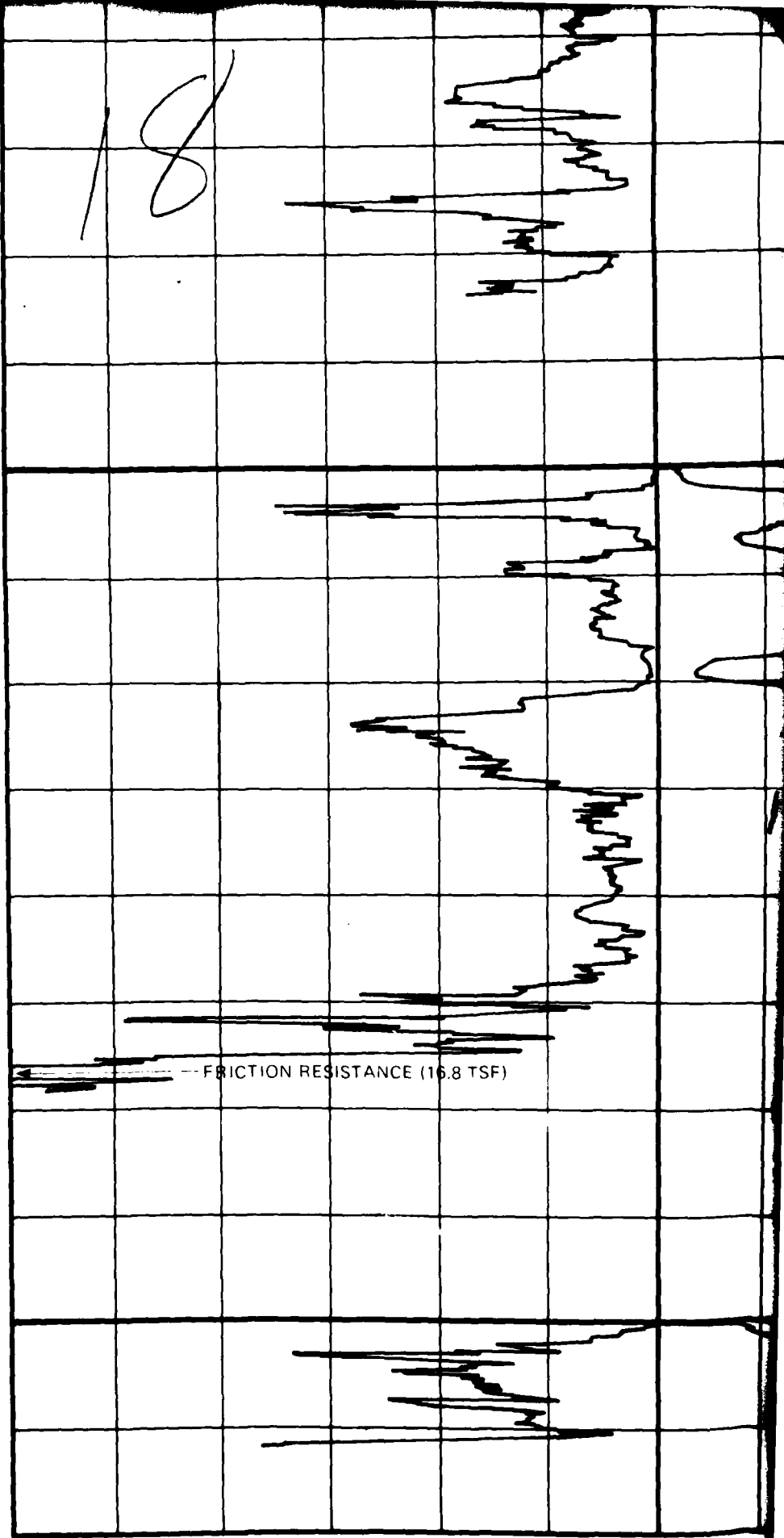
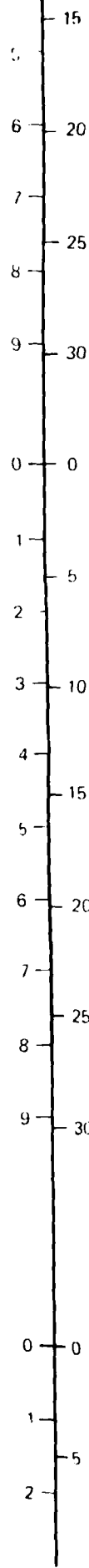
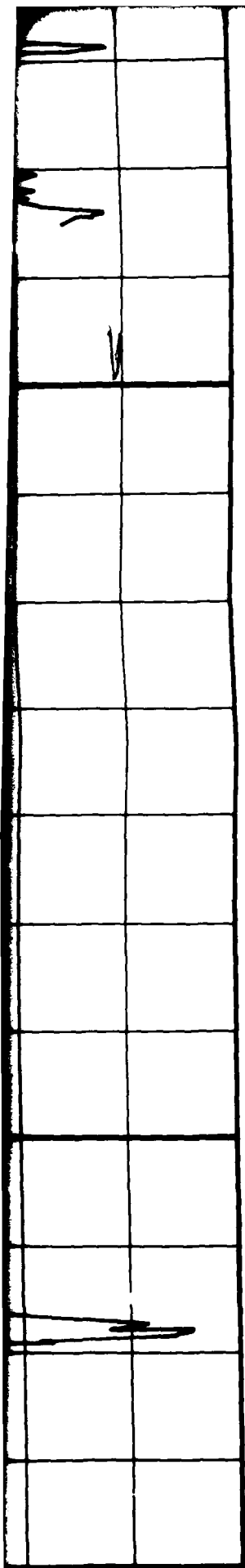
SM

SC

SM

SP





4 0 8 (%)

12 10 8 6 4 2 0 10

19

C 23 SURFACE ELEVATION 5365' (1635m)
SURFICIAL GEOLOGIC UNIT A5y

C 24 SURFACE ELEVATION 5530' (1686m)
SURFICIAL GEOLOGIC UNIT A5i

C 25 SURFACE ELEVATION 5720' (1743m)
SURFICIAL GEOLOGIC UNIT A5j

S.S.

S.V.
S.M.

S.V.
S.V.

SP
S.V.

T

5365' (1635m)
JNT A5y

S.S.

S.W.
SM

T 9

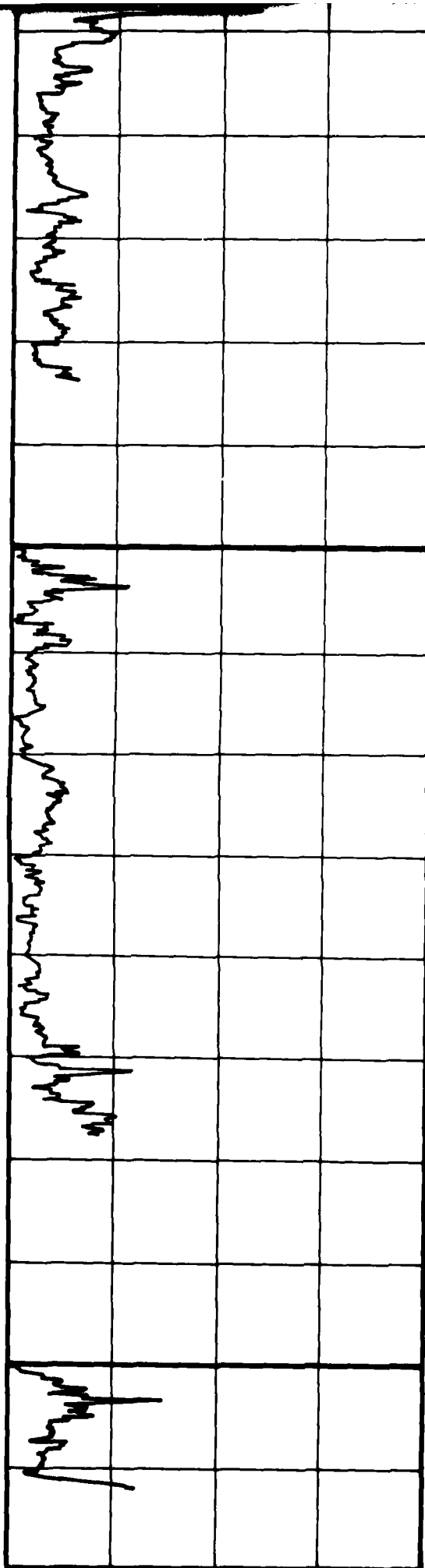
20' (1686m)
T. A5i

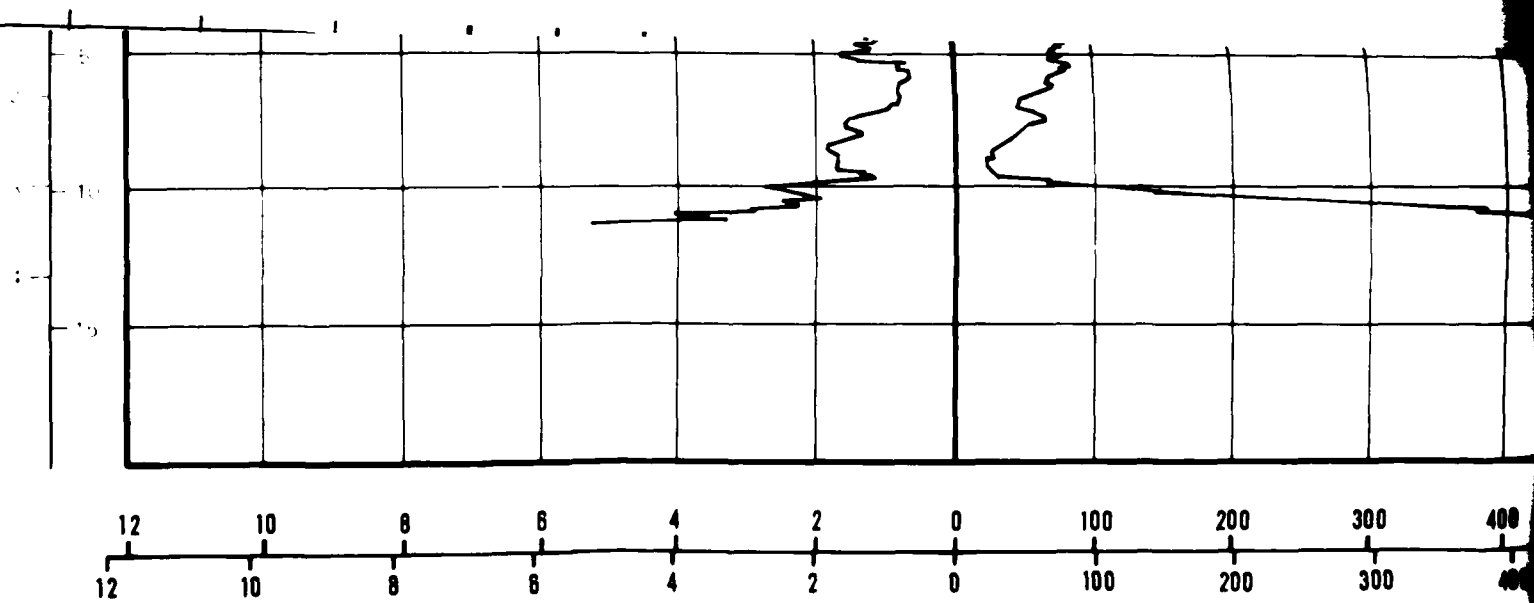
SW
SM

SP
SM

20' (1743m)
T. A5i

T 10

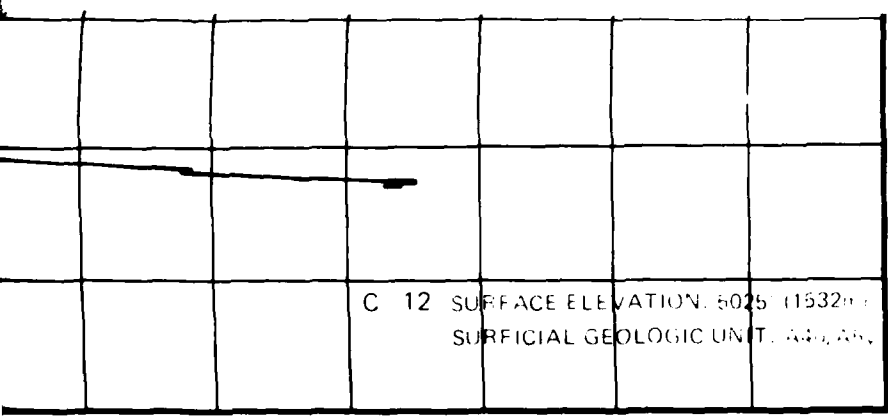




FRICTION RESISTANCE

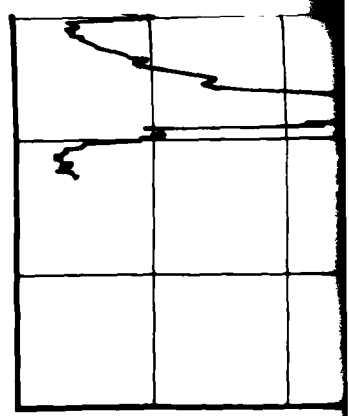
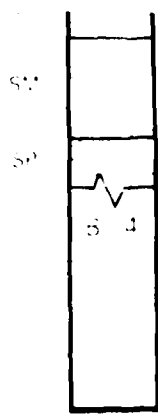
CONE

51



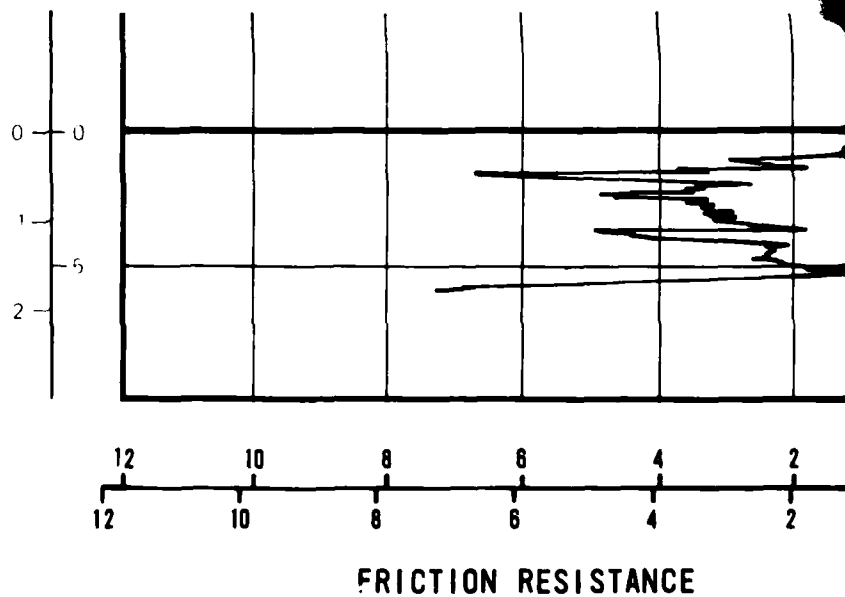
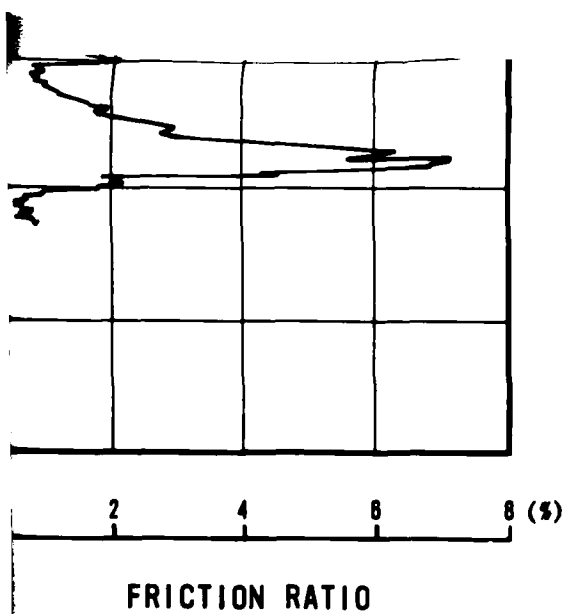
C 12 SURFACE ELEVATION: 5025' (1532m)
SURFICIAL GEOLOGIC UNIT: A4, A5,

CONE RESISTANCE

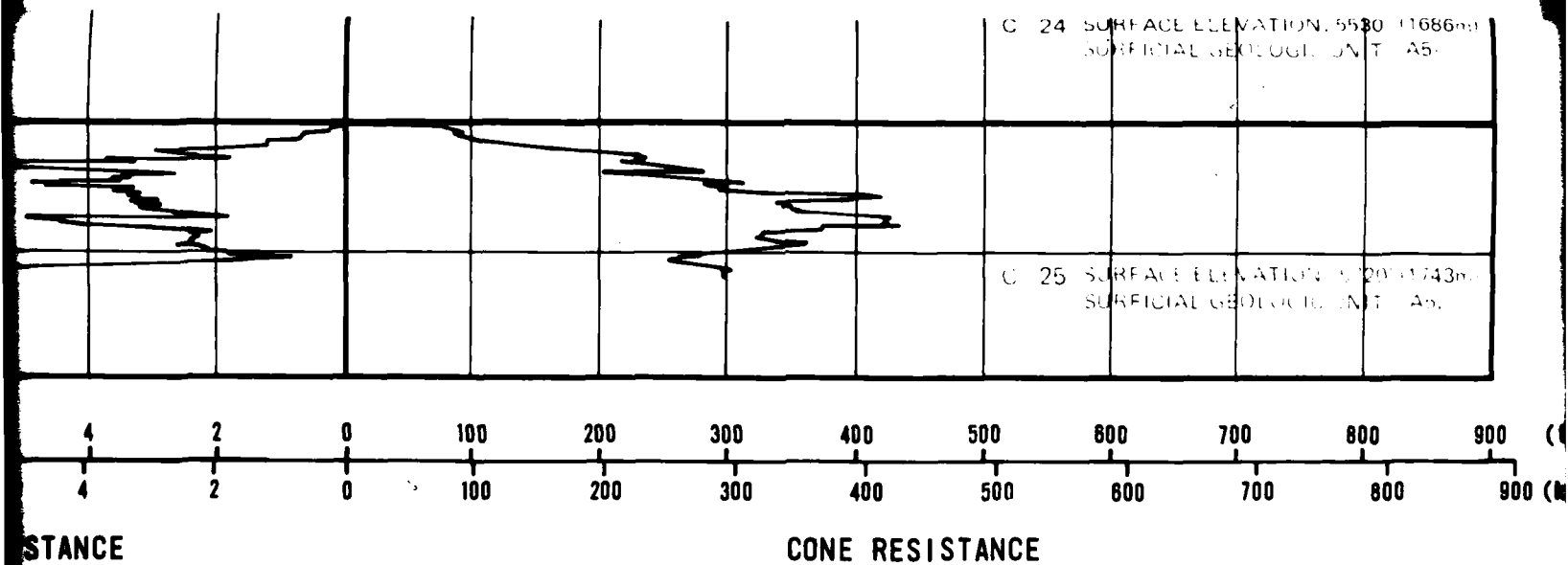


FRICTION R

22

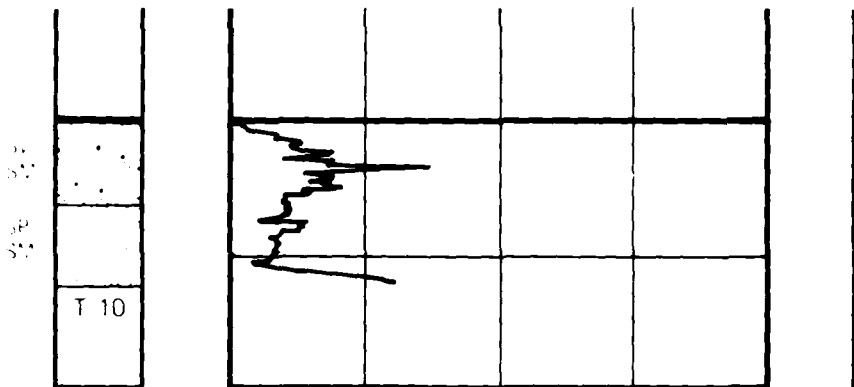


23



24

ELEVATION: 9530 (1686)		
AL GEOLOGICAL UNIT: Aa		
ELEVATION: 9200 (1436)		
AL GEOLOGICAL UNIT: Aa		



700 800 900 (tsf)
700 800 900 (kg/cm²)

0 2 4 6 8 (%)

FRICITION RATIO

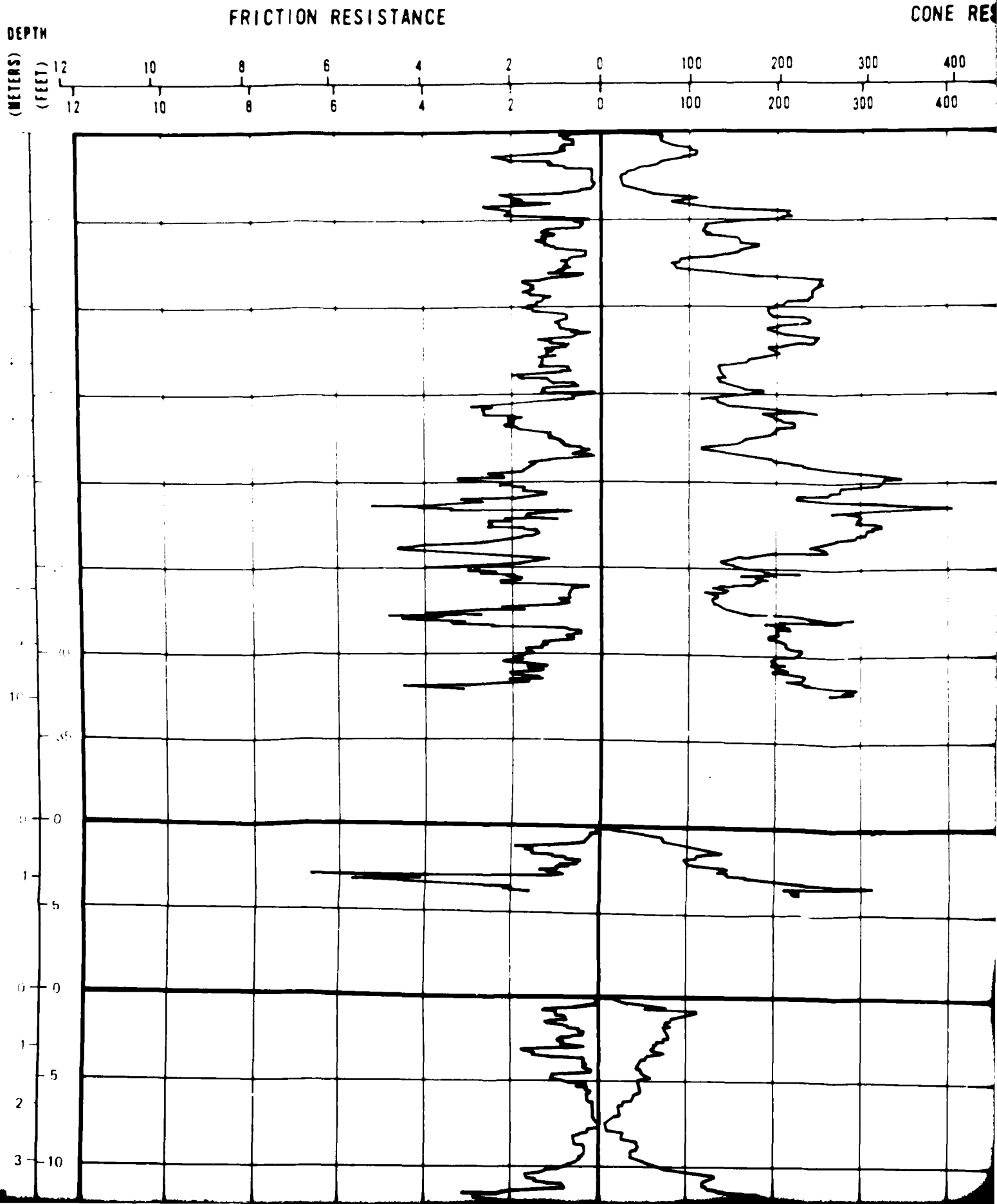
CONE PENETROMETER TEST RESULTS WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

DRAWING
II-10-1
1 OF 4

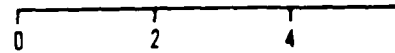
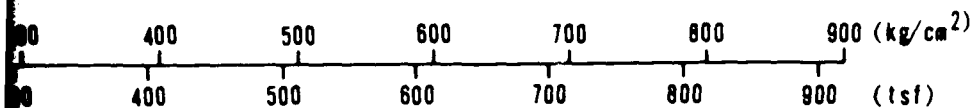
FUGRO NATIONAL, INC.

25



CONE RESISTANCE

FRICTION RATIO



SOIL COLUMN

CS 26

SM

SP
SM

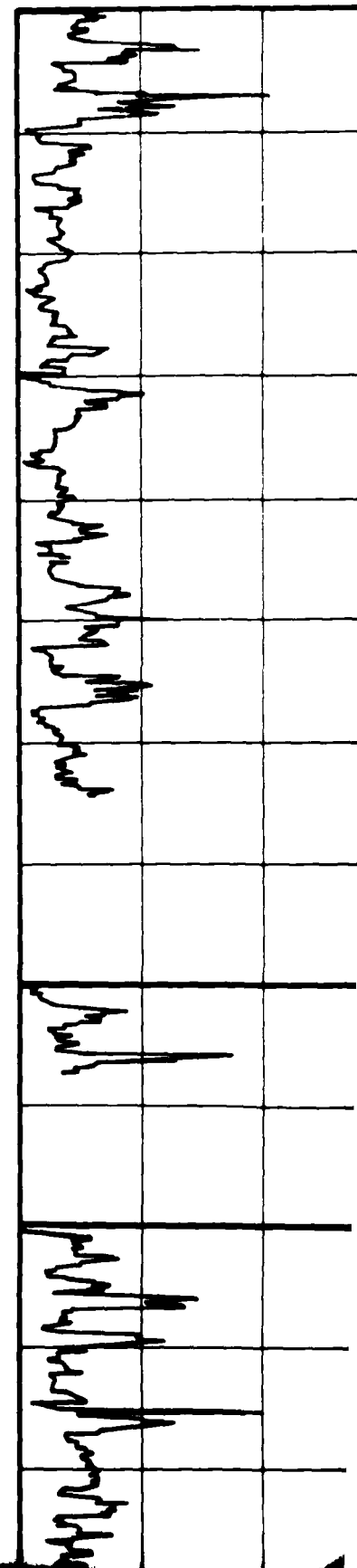
P 6

SM

CS 28

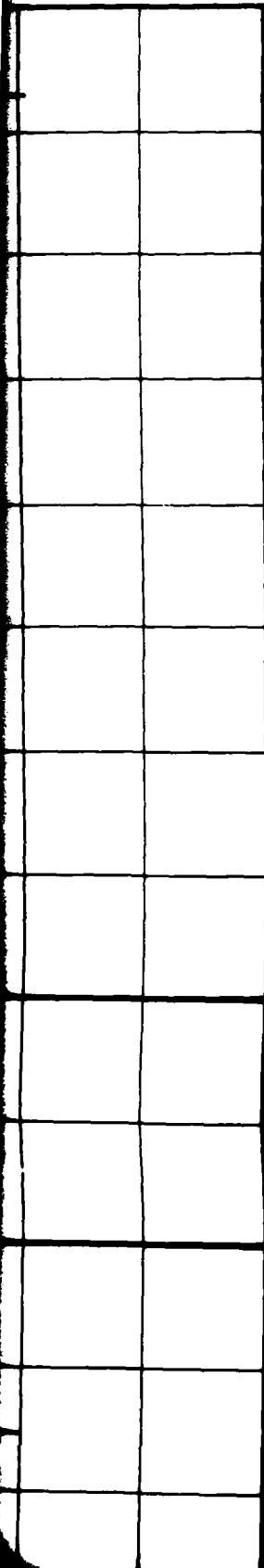
C 26 SURFACE ELEVATION: 5560' (1695m)
SURFICIAL GEOLOGIC UNIT: ASy

C 27 SURFACE ELEVATION: 5270' (1606m)
SURFICIAL GEOLOGIC UNIT: ASy



IN RATIO

4 6 8 (%)

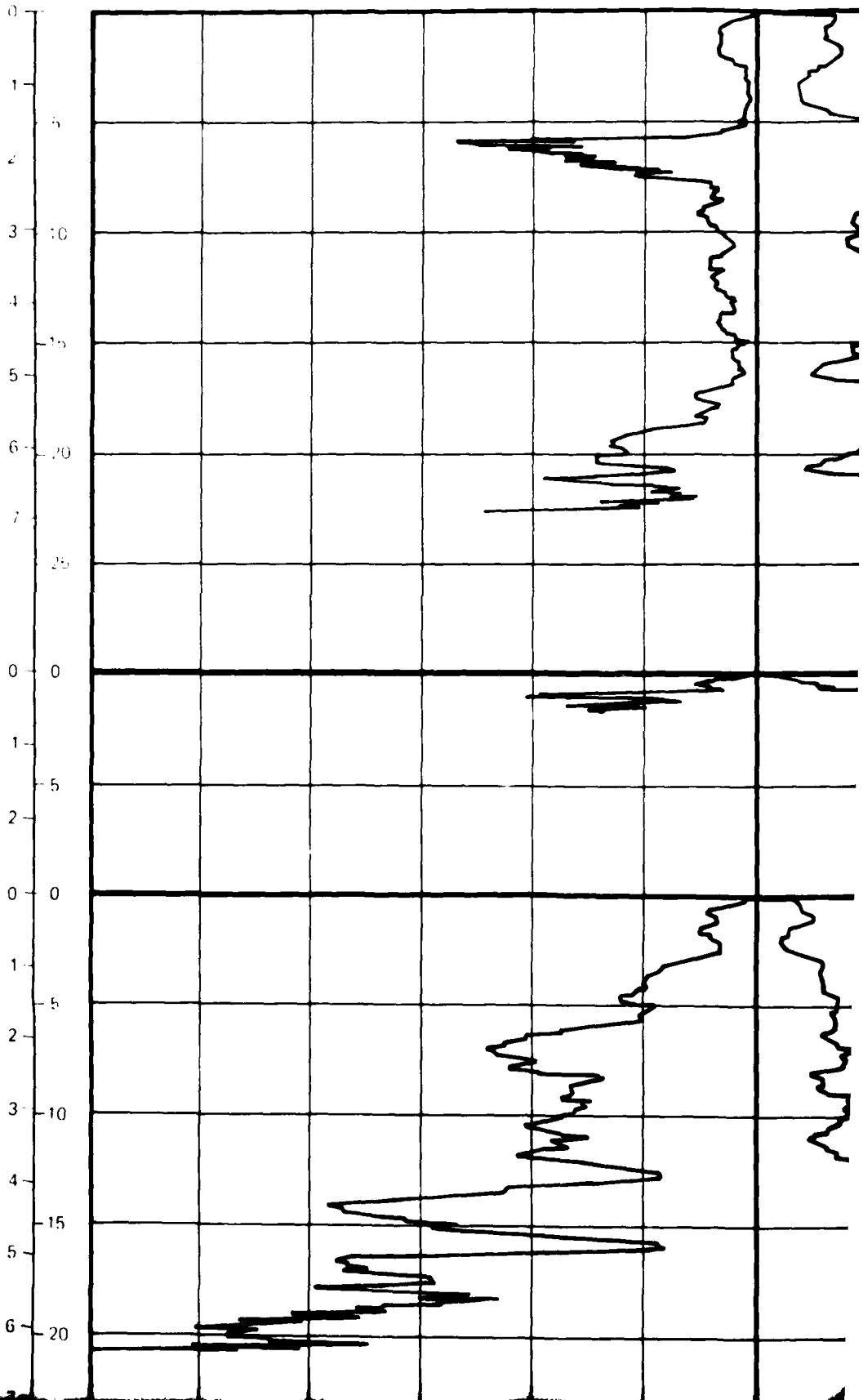


FRICTION RESISTANCE

DEPTH

(METERS)
(FEET)

12 10 8 6 4 2 0 1
12 10 8 6 4 2 0 11



CONE RESISTANCE

100 200 300 400 500 600 700 800 900 (kg/cm²)
 100 200 300 400 500 600 700 800 900 (tsf)

SOIL
COLUMN

SM

P-8

C 36 SURFACE ELEVATION: 4770' (1454m)
 SURFICIAL GEOLOGIC UNIT: A5, A4

GM

CS-37

C 37 SURFACE ELEVATION: 4920' (1500m)
 SURFICIAL GEOLOGIC UNIT: A5, A4

ML

SH

ML

SW
SM

B-2

FRICTION RATIO

(kg/cm²)

(tsf)

SOIL
COLUMN

0 2 4 6 8 (%)

SM

P 8

GM

CS 37

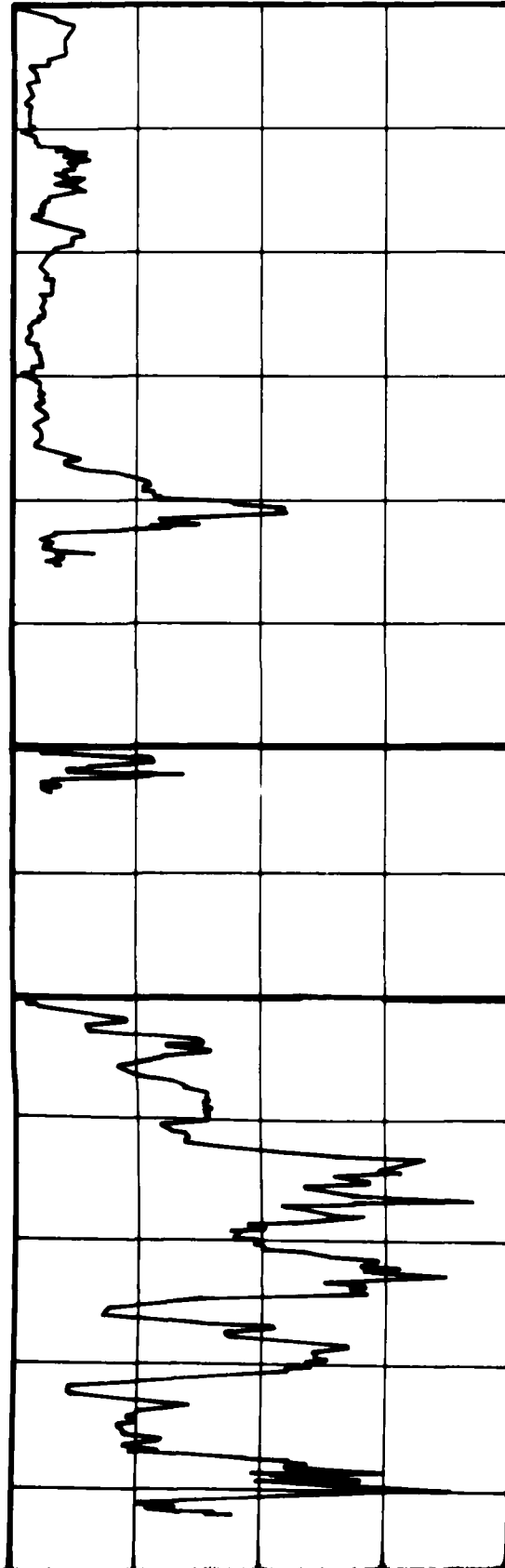
ML

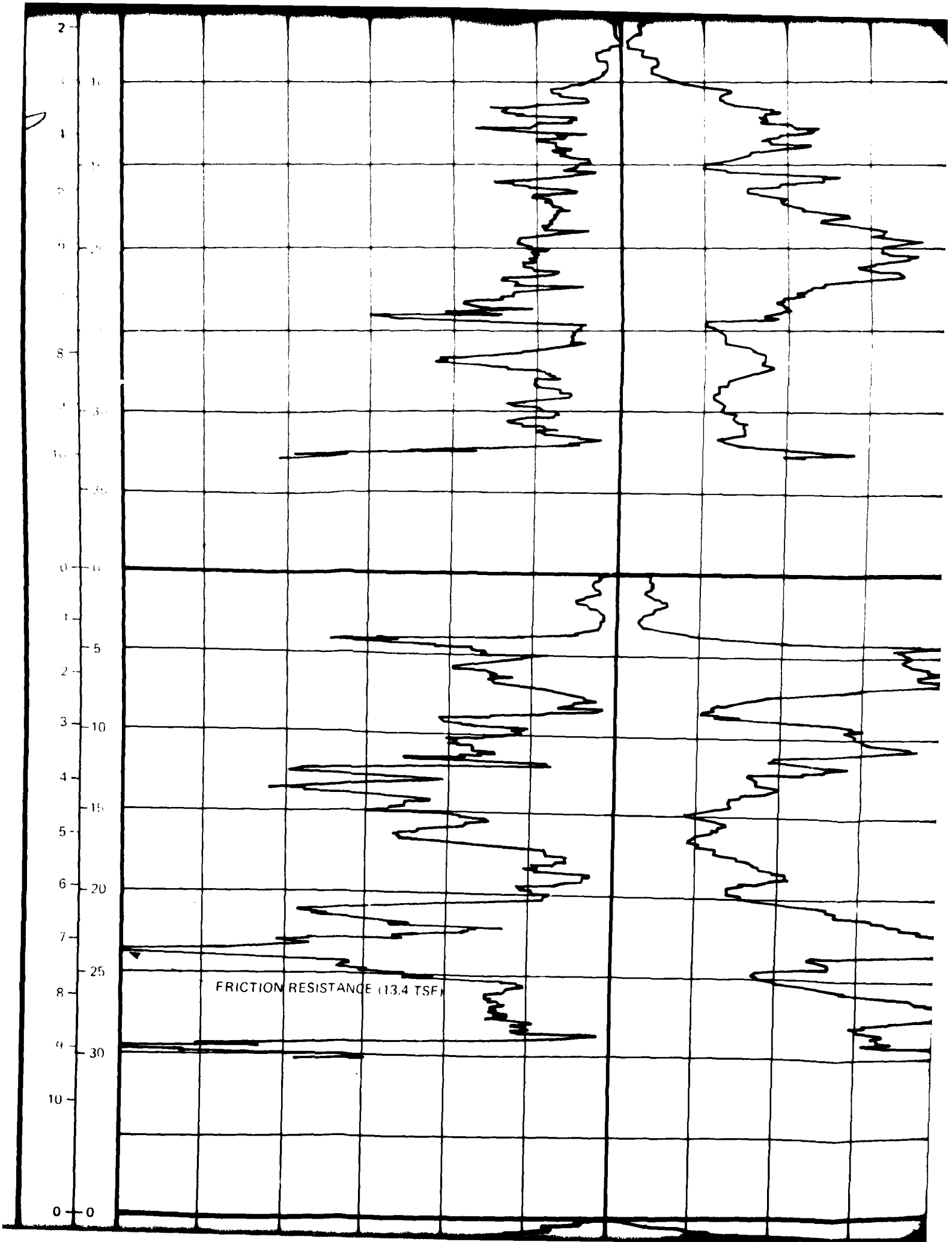
ML

ML

SW
SM

B-2





C - 28 SURFACE ELEVATION: 5110' (1558m)
SURFICIAL GEOLOGIC UNIT: A5y/A4u

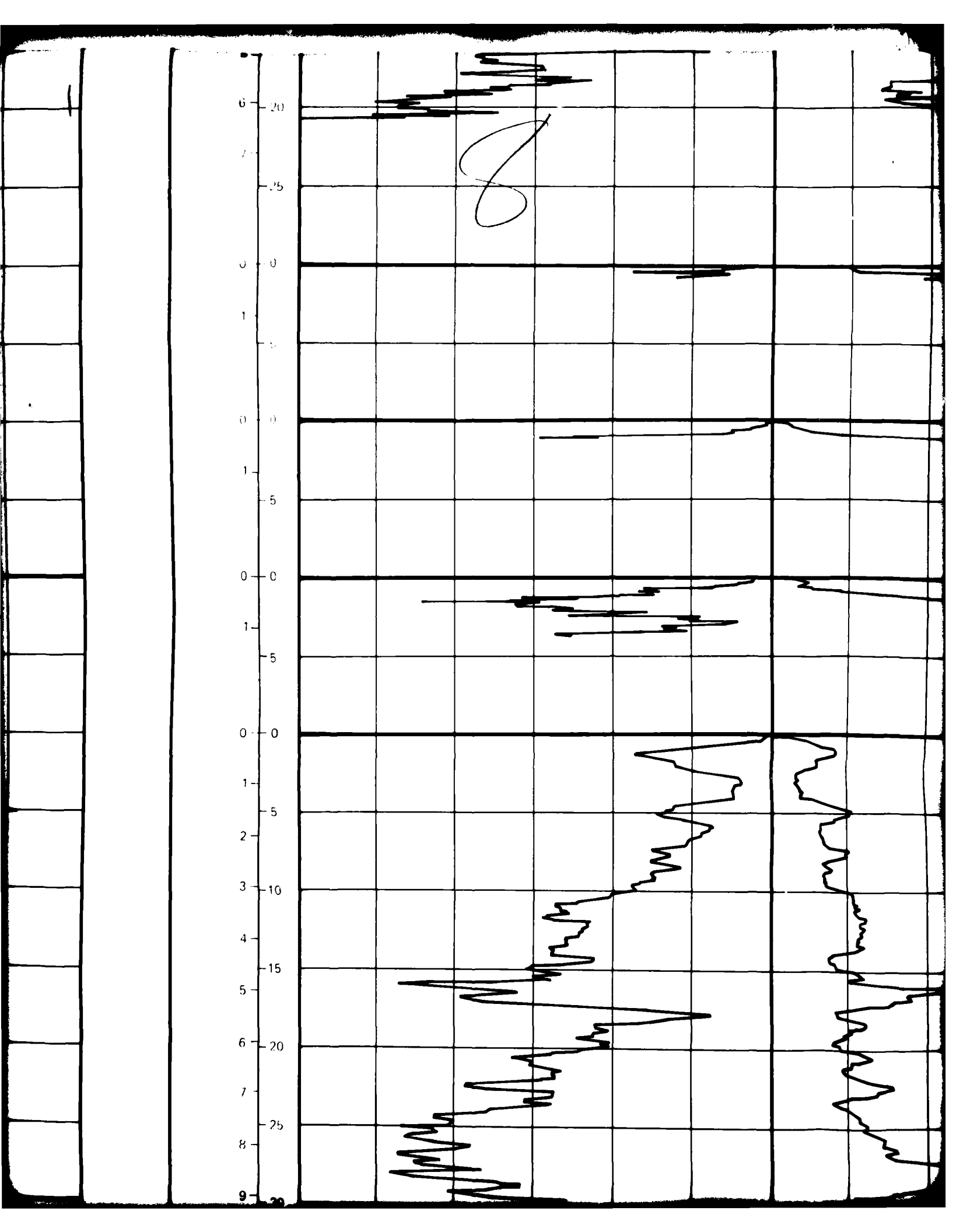
C - 29 SURFACE ELEVATION: 4950' (1509m)
SURFICIAL GEOLOGIC UNIT: A5y

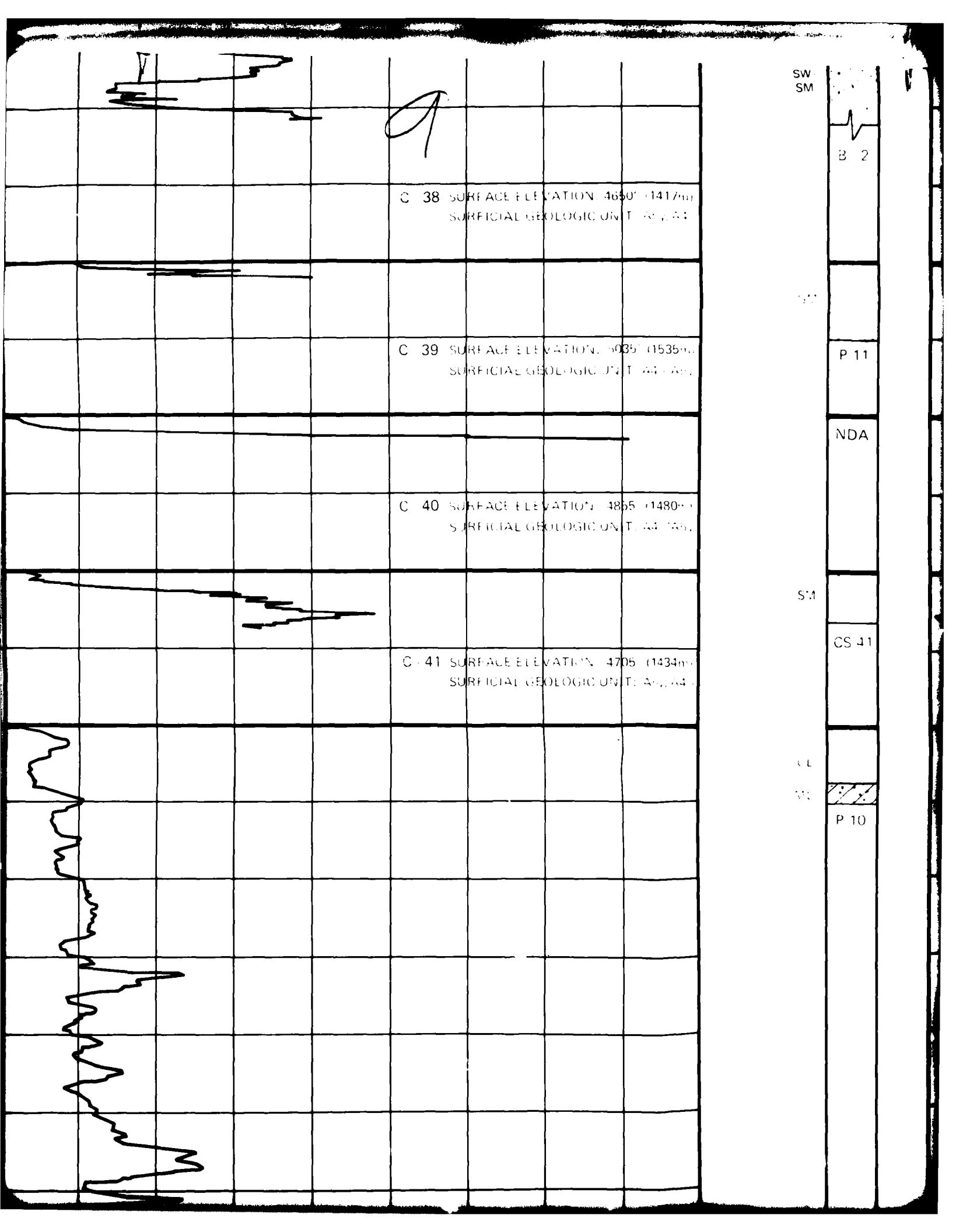
ML

SW
SM

P 7

SM





C 38 SURFACE ELEVATION: 4650' (1417m)
SURFICIAL GEOLOGIC UNIT: A4, A4

C 39 SURFACE ELEVATION: 5035' (1535m)
SURFICIAL GEOLOGIC UNIT: A4, A4

C 40 SURFACE ELEVATION: 4855' (1480m)
SURFICIAL GEOLOGIC UNIT: A4, A4

C 41 SURFACE ELEVATION: 4705' (1434m)
SURFICIAL GEOLOGIC UNIT: A4, A4

SW
SM

B 2

P 11

NDA

S 1

CS 41

CL

W

P 10

SW
SM

B 2

GM

P-11

NDA

SM

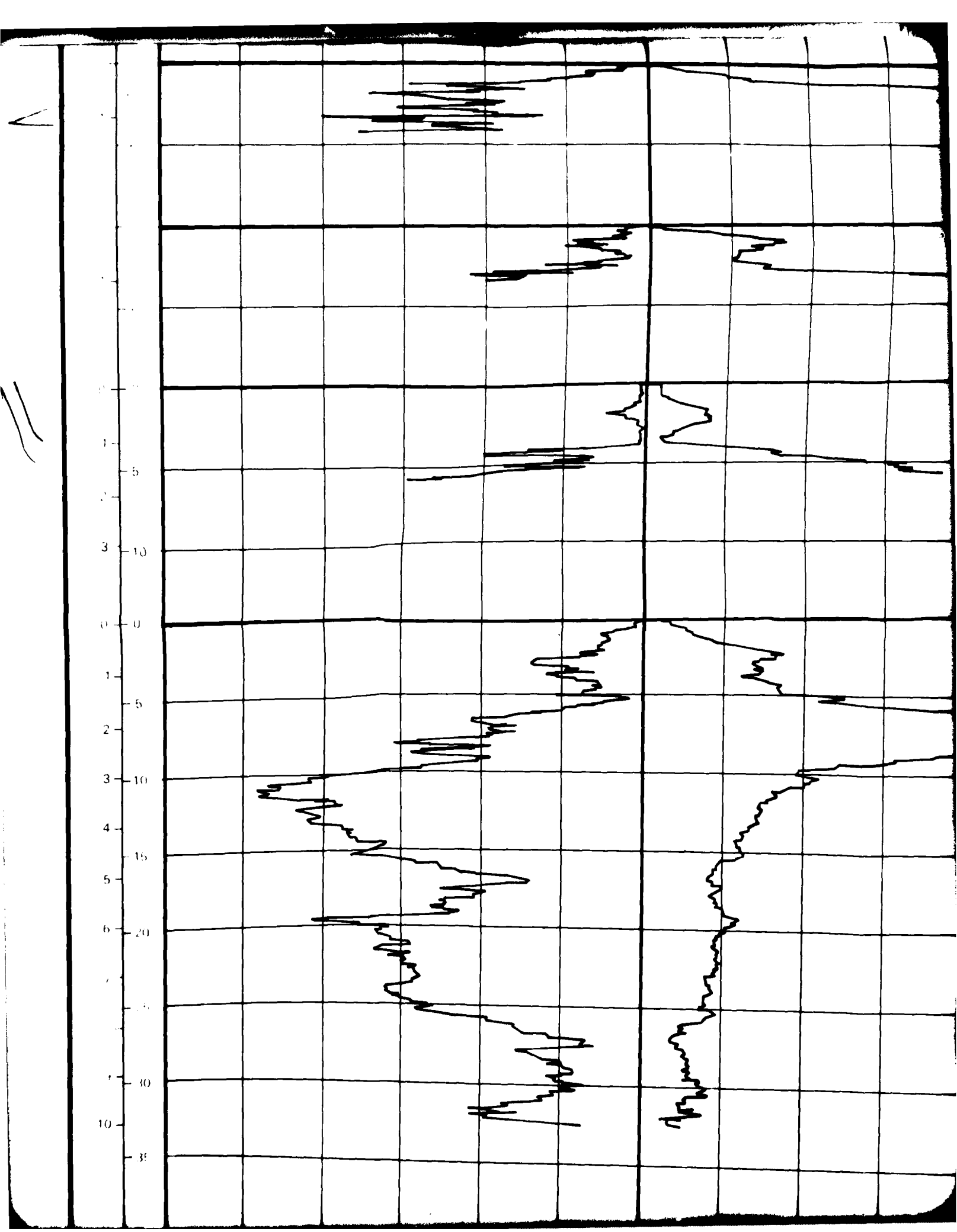
CS 41

CL

ML

P 10

10



C 30 SURFACE ELEVATION: 519' (1583m)
SURFICIAL GEOLOGIC UNIT: Asv

C 31 SURFACE ELEVATION: 5045' (1538m)
SURFICIAL GEOLOGIC UNIT: Asv

C 32 SURFACE ELEVATION: 4875' (1486m)
SURFICIAL GEOLOGIC UNIT: Asv

SM

CS 30

T 13

SM

SP
SM

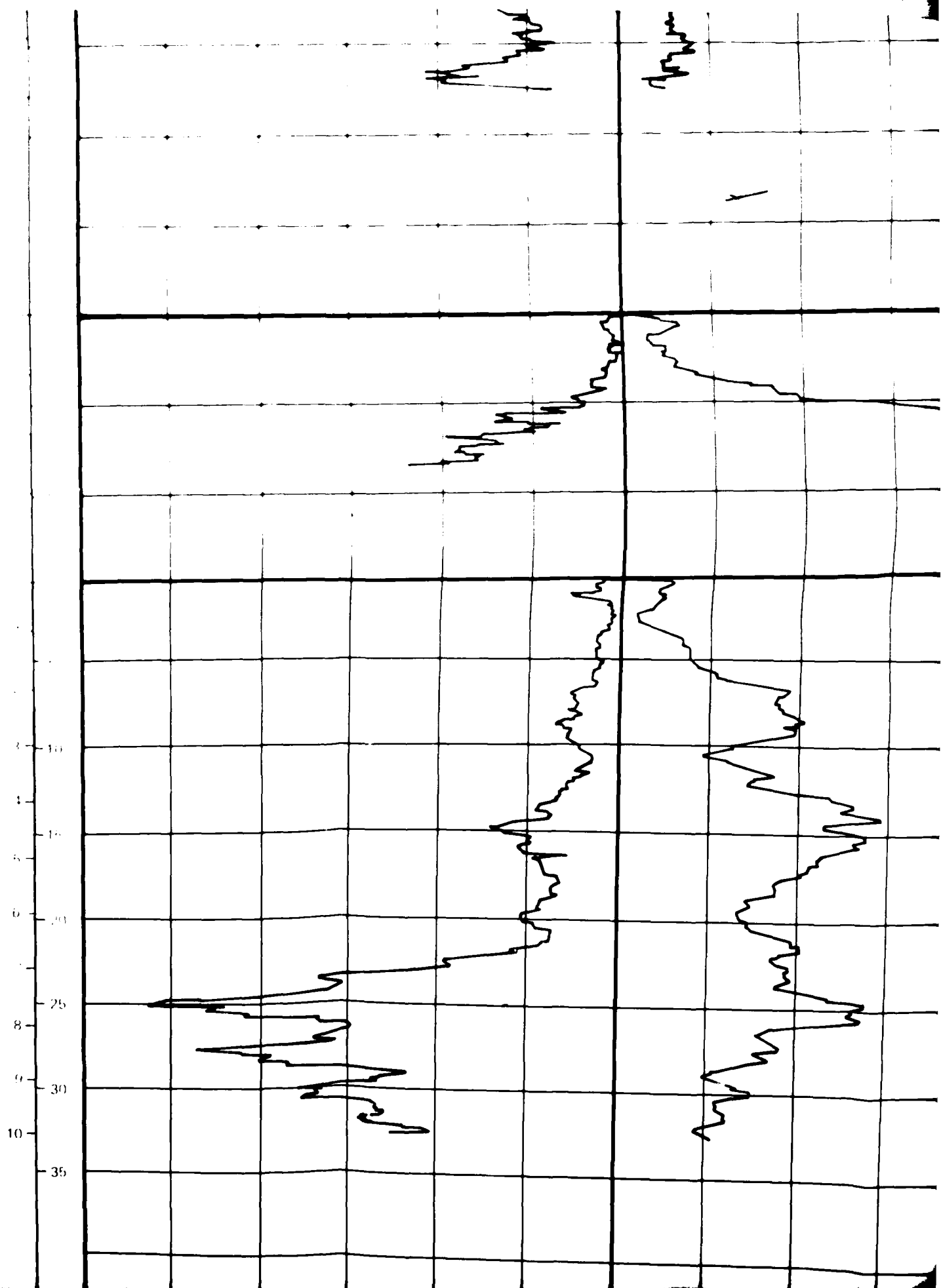
B 3

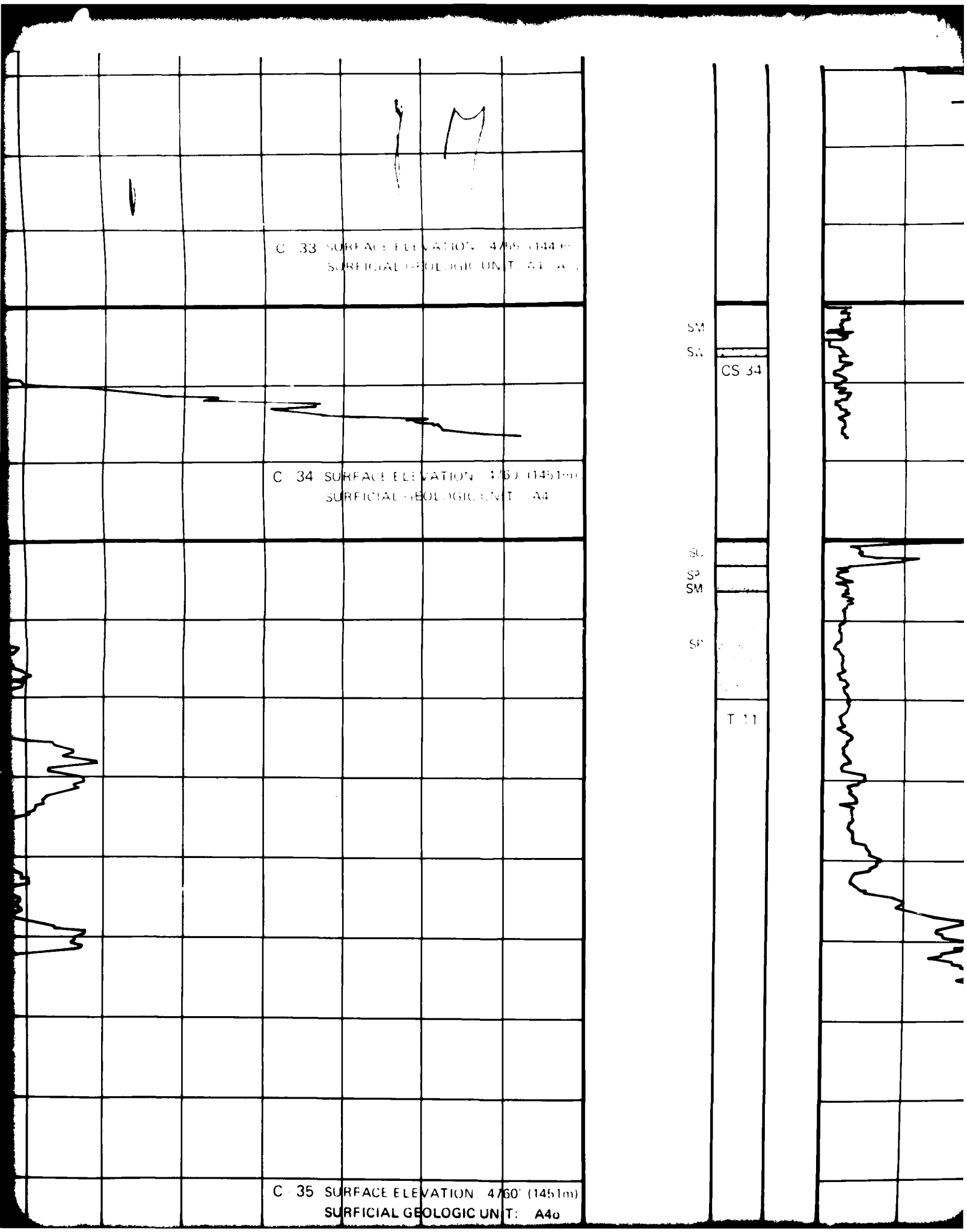
SM

P 9

C-42 SURFACE ELEVATION 4640 (1414m)
SURFICIAL GEOL. UNIT A4

C-43 SURFACE ELEVATION 4635 (1412m)
SURFICIAL GEOL. UNIT A1, A2





C 33 SURFACE ELEVATION: 4755' (144m)
SURFICIAL GEOLOGIC UNIT: A4

C 34 SURFACE ELEVATION: 4760' (1451m)
SURFICIAL GEOLOGIC UNIT: A4

C 35 SURFACE ELEVATION: 4760' (1451m)
SURFICIAL GEOLOGIC UNIT: A4

SM

SA

CS 34

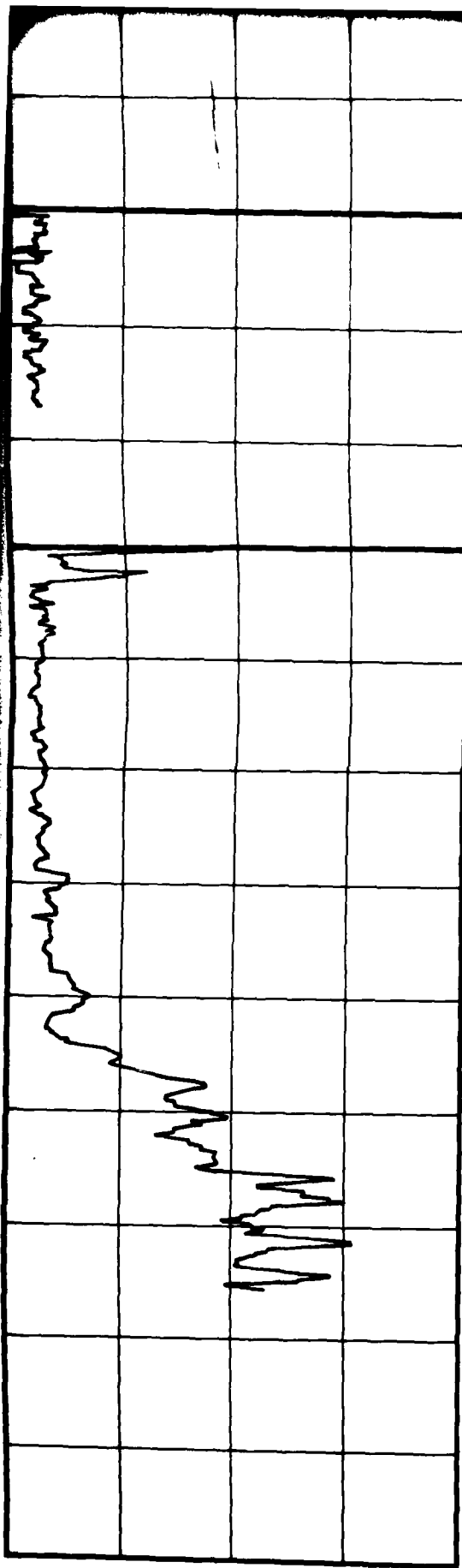
SU

SP

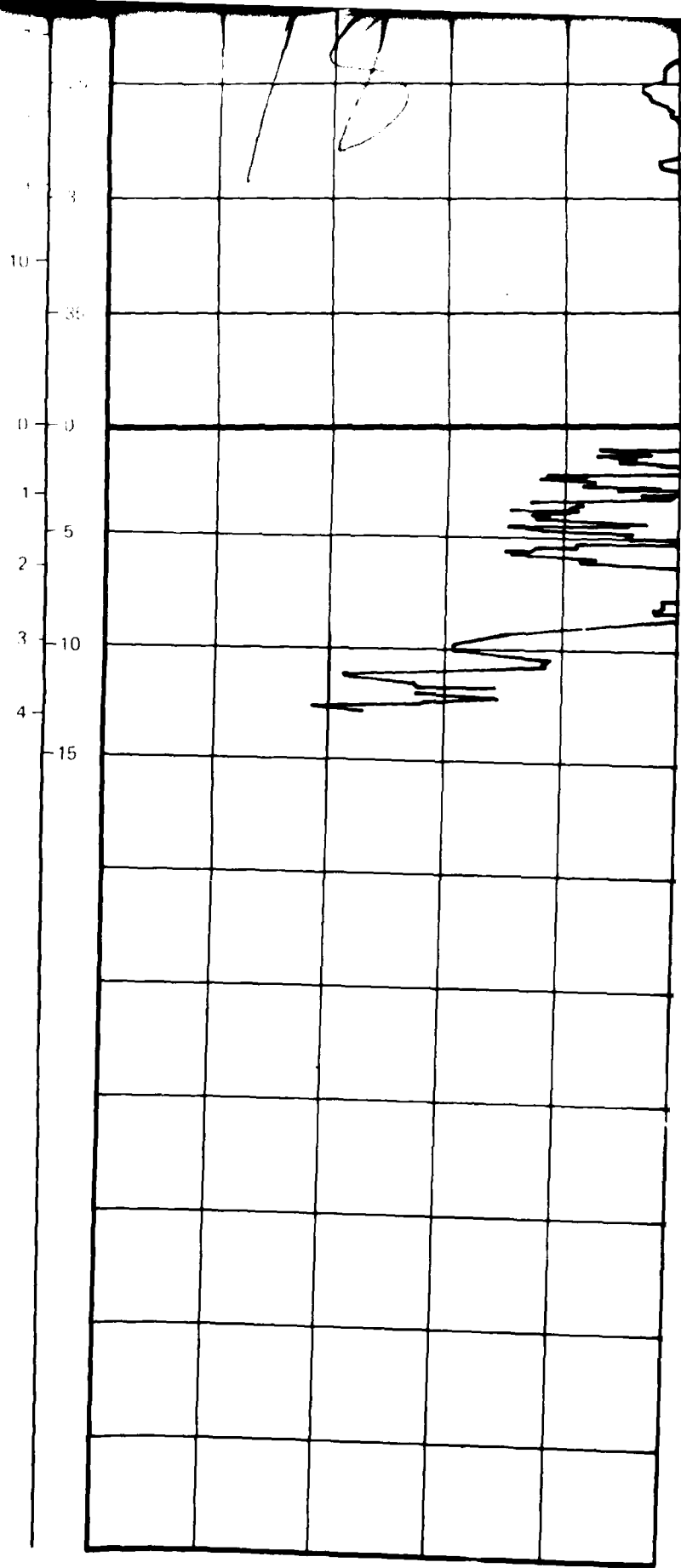
SM

SP

T 11



FRICION RATIC

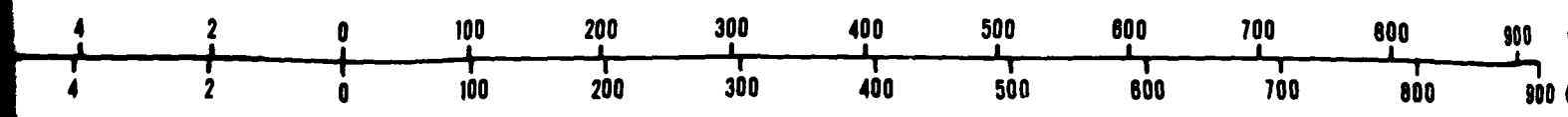
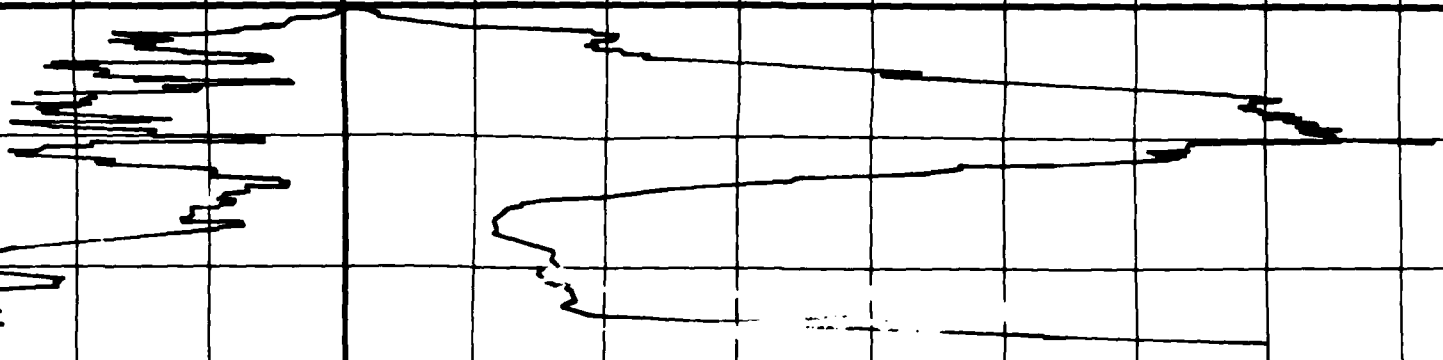


FRICION RESISTANCE

19

C 44 SURFACE ELEVATION 4670 (142)
SURFICIAL GEOLOGIC UNIT A4 (A)

C 45 SURFACE ELEVATION 4690 (1430)
SURFICIAL GEOLOGIC UNIT A4 (A)



DISTANCE

CONE RESISTANCE

ELEVATION: 4670 (1423m)
LOGIC UNIT: A4 (AB)

SM

CS 45

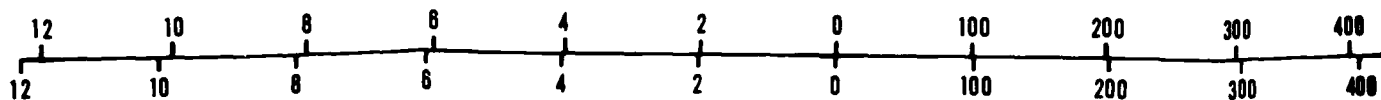
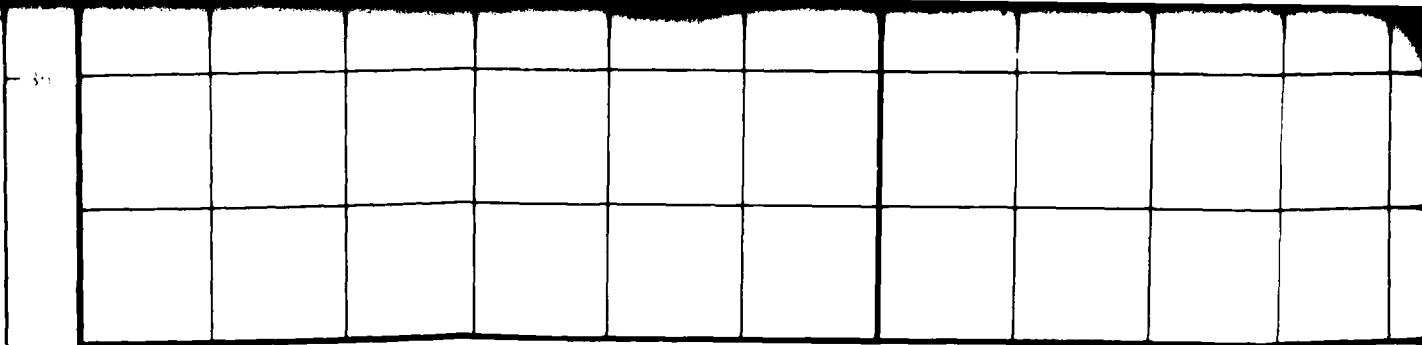
ELEVATION: 4690 (1430m)
LOGIC UNIT: A4 (AB)

700 800 900 (tsf)
700 800 900 (kg/cm²)

0 2 4 6 8 (%)

FRICTION RATIO

10-



FRICTION RESISTANCE

CONE

21

24 MAR 81

C 35 SURFACE ELEVATION 4760' (1451m)
SURFICIAL GEOLOGIC UNIT A4

0 100 200 300 400 500 600 700 800 900 (tsf)
0 100 200 300 400 500 600 700 800 900 (kg/cm²)

CONE RESISTANCE

22

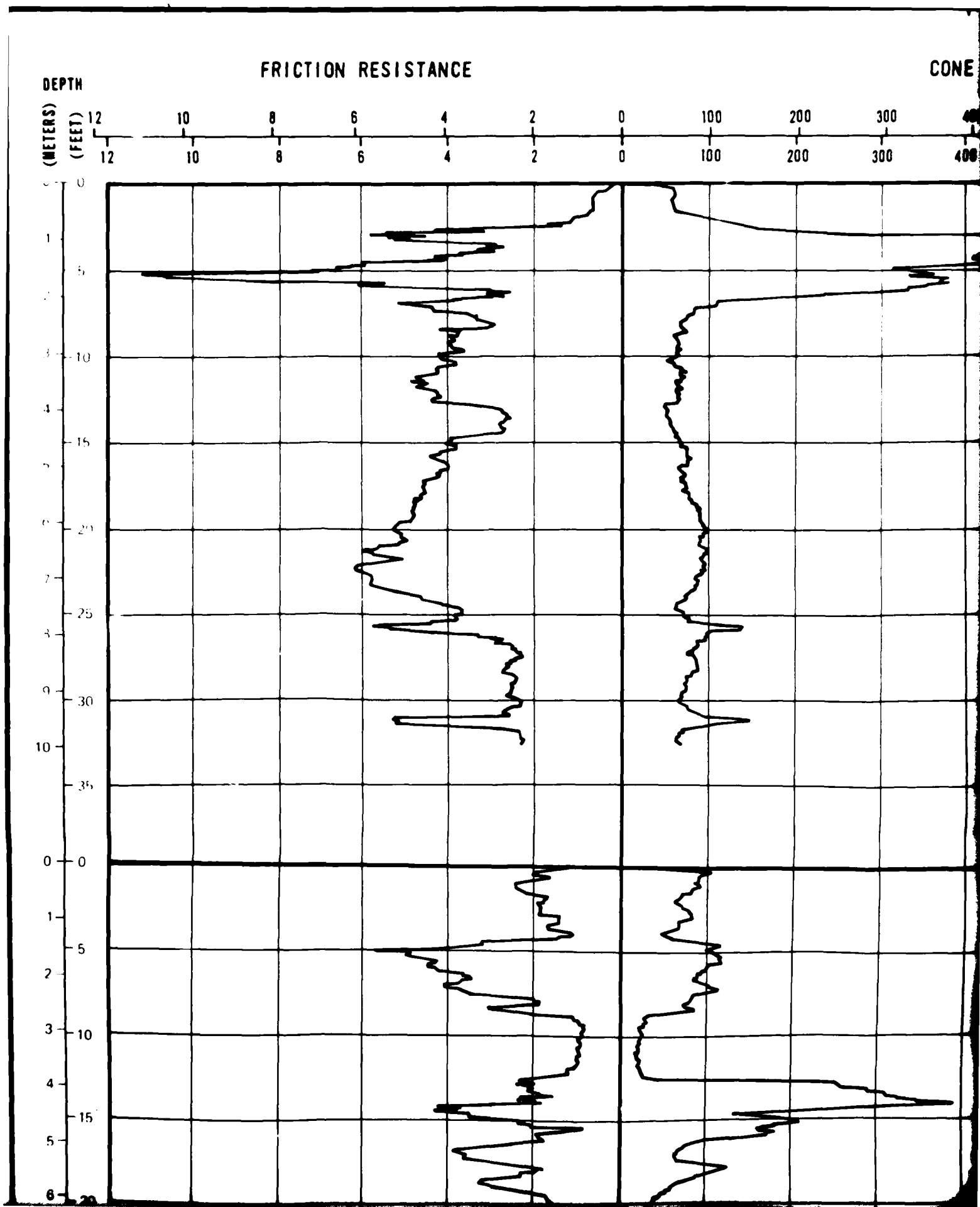
CONE PENETROMETER TEST RESULTS
WAH WAH VALLEY, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

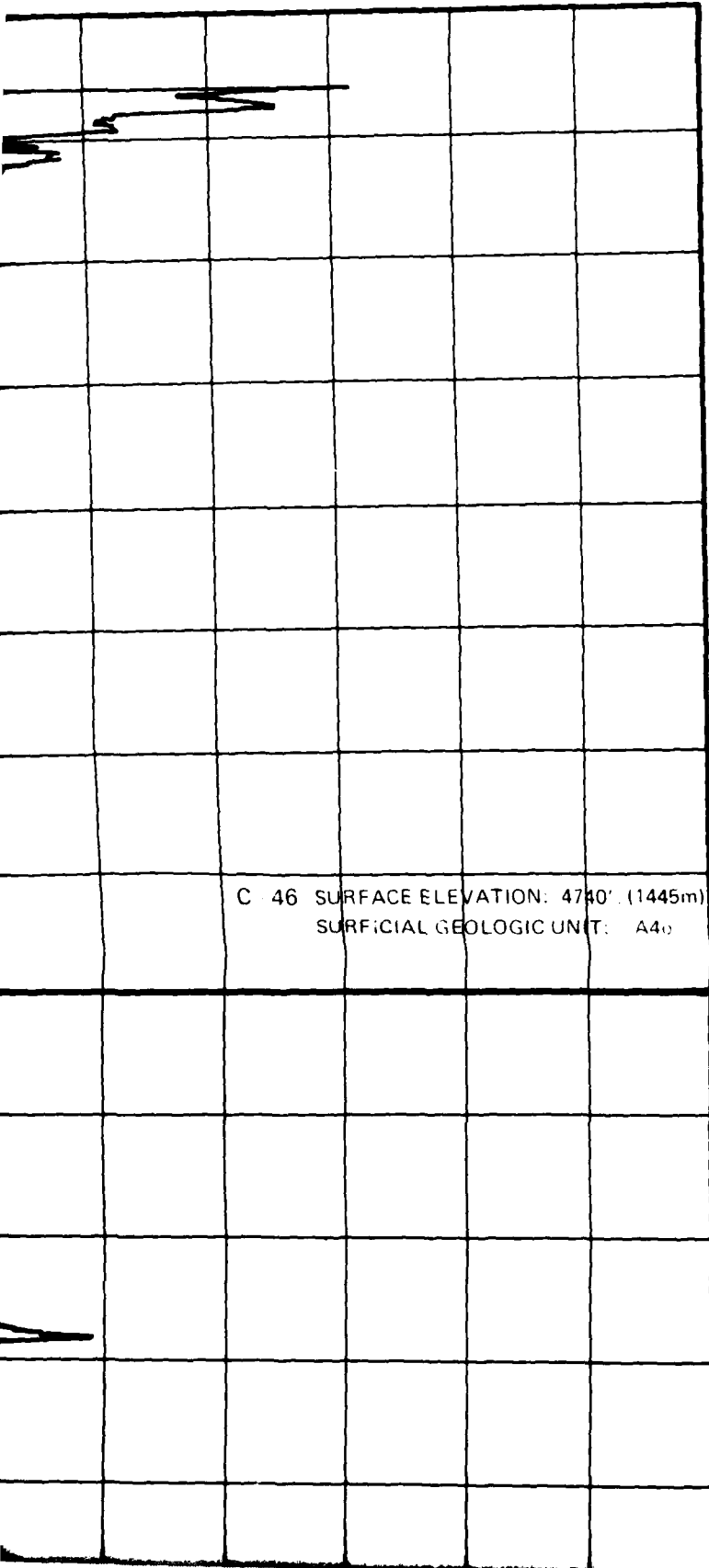
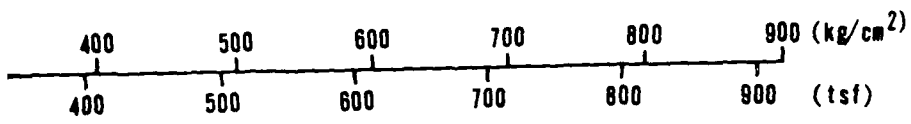
DRAWING
II-10-1
2 OF 4

23

FUGRO NATIONAL, INC.

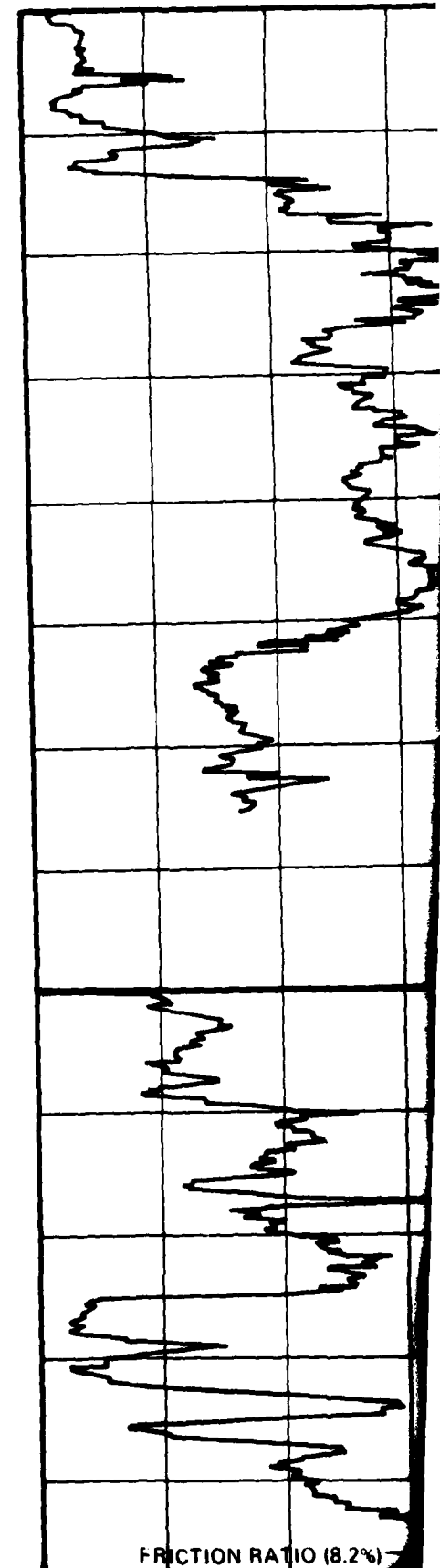
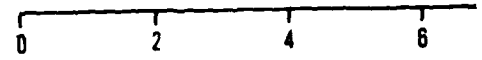


CONE RESISTANCE



C-46 SURFACE ELEVATION: 4740' (1445m)
SURFICIAL GEOLOGIC UNIT: A4b

FRICTION RATIO



SOIL COLUMN

NDA

ML

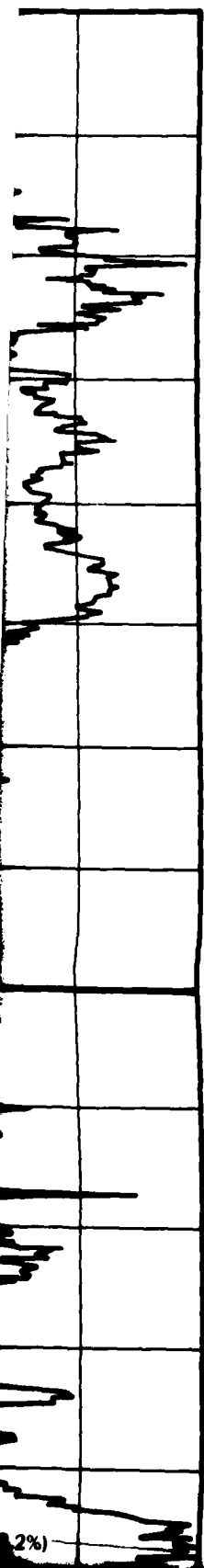


CS 47

FRICTION RATIO (8.2%)

T10

6 8 (%)

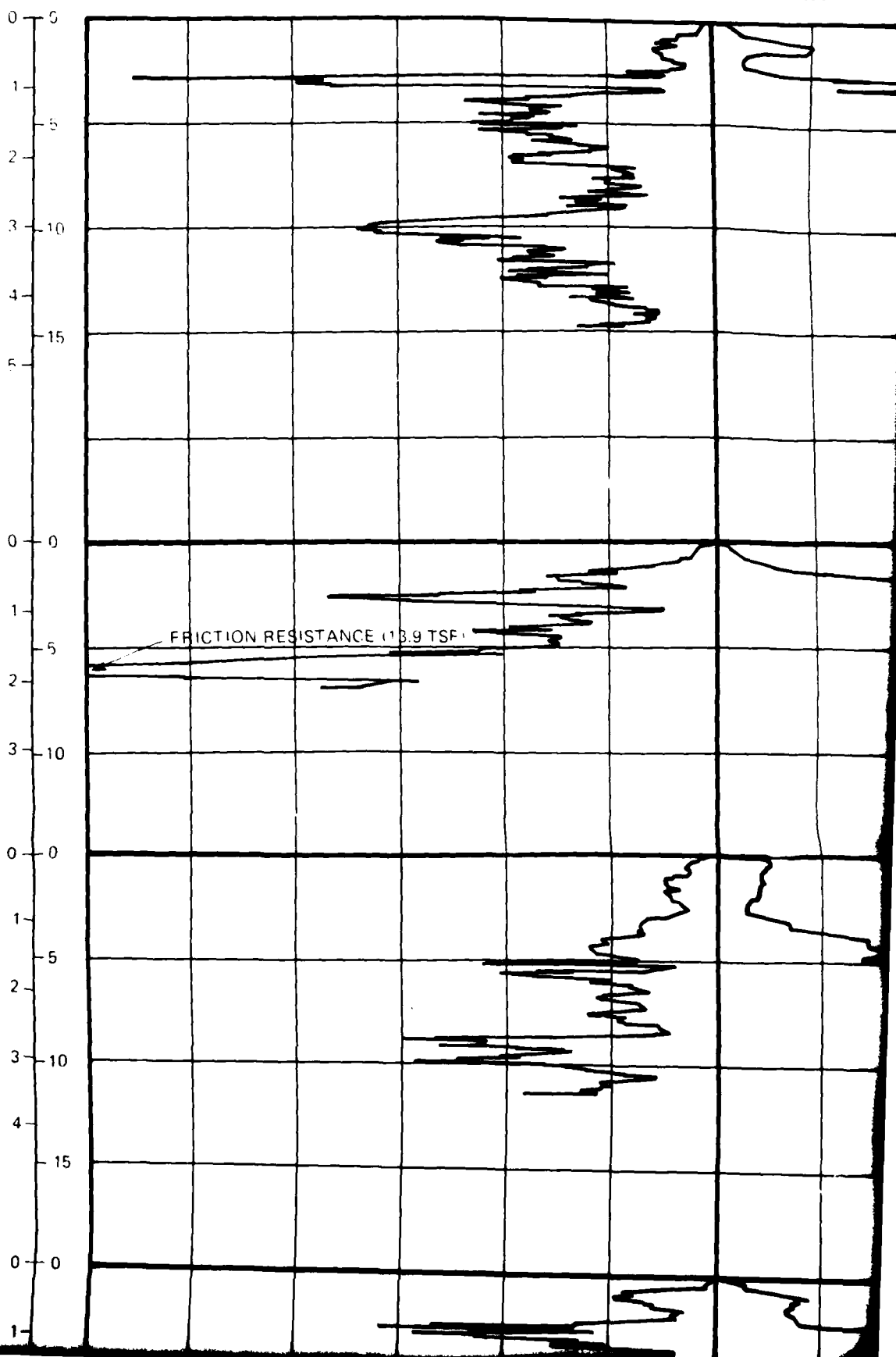


DEPTH

FRICTION RESISTANCE

(METERS)
(FEET)

12 10 8 6 4 2 0 100
12 10 8 6 4 2 0 100



4

CONE RESISTANCE

0 100 200 300 400 500 600 700 800 900 (kg/cm²)
 0 100 200 300 400 500 600 700 800 900 (tsf)

SOIL
COLUMN

ST

P 11

C 53 SURFACE ELEVATION 4955' (1510m)
 SURFICIAL GEOLOGIC UNIT: A5, A4

SM

CS 54

C 54 SURFACE ELEVATION 5015' (1529m)
 SURFICIAL GEOLOGIC UNIT: A5, A4

SM

GP
GV

P 12

C 55 SURFACE ELEVATION 5080' (1548m)
 SURFICIAL GEOLOGIC UNIT: A5, A4

SM

FRICTION RATIO

900 (kg/cm²)

900 (tsf)

SOIL
COLUMN

0 2 4 6 8 (%)

SM

P 14

10m)

y/A4

SM

CS 54

529m)

y/A4

SM

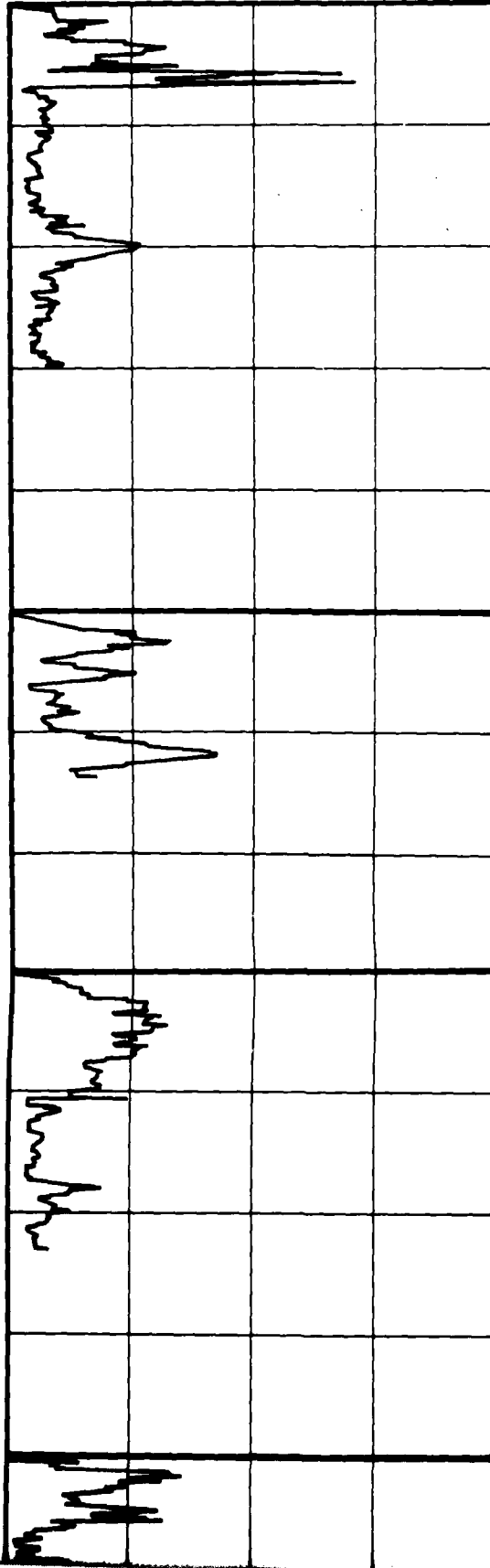
GP
GM

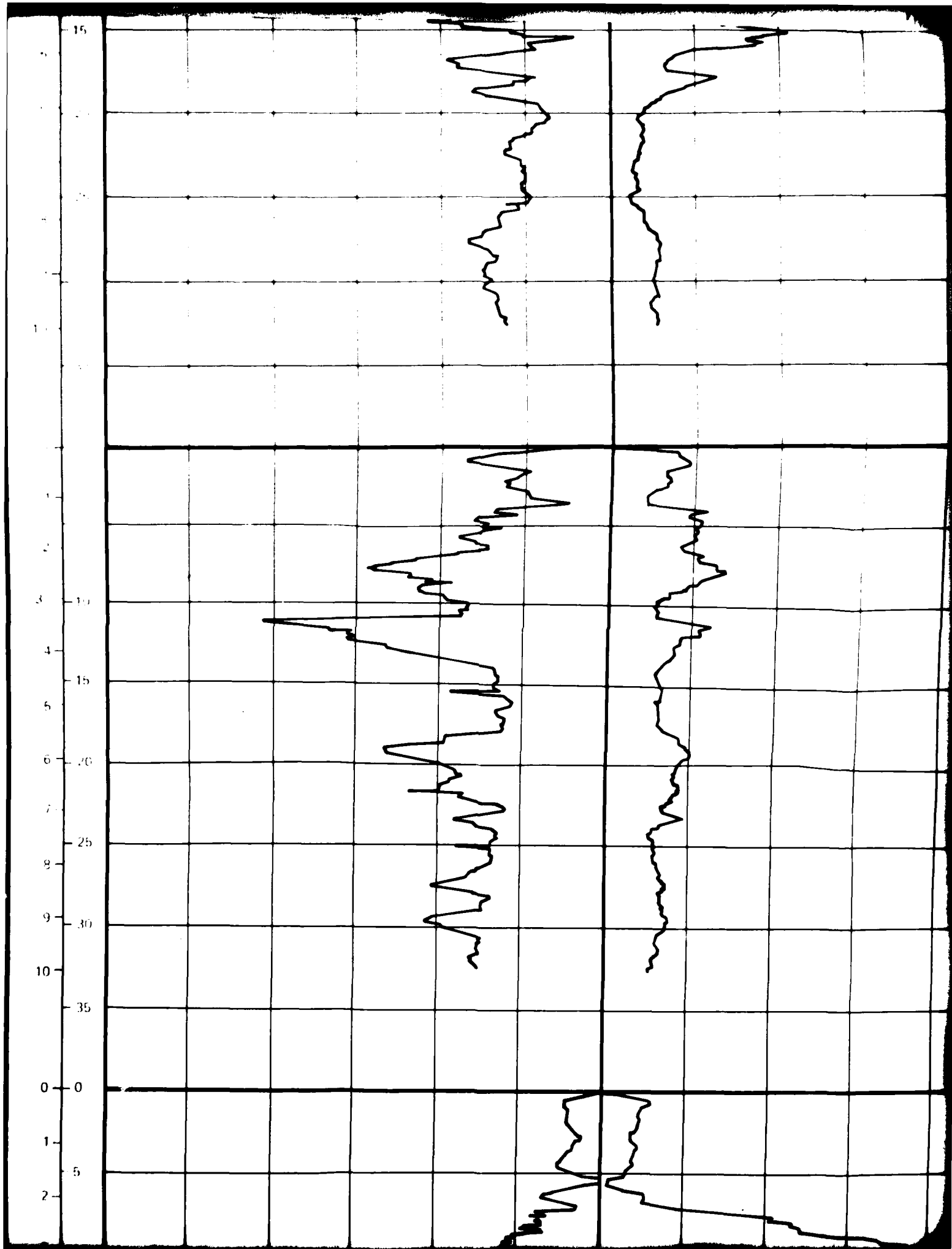
P 12

548m)

y/A4

SM





Y

1

FRICTION RATIO (8.2

FRICTION RATIO (9.

C - 47 SURFACE ELEVATION 1640 (1414m)
SURFICIAL GEOLOGIC UNIT A4

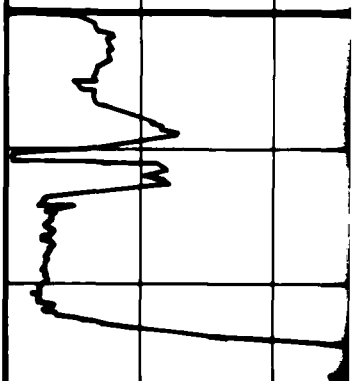
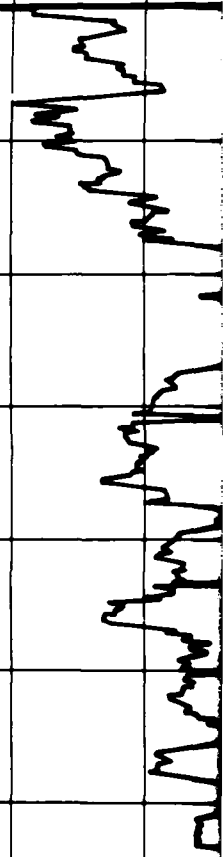
CL
VL

P 16

C - 48 SURFACE ELEVATION: 4655' (1419m)
SURFICIAL GEOLOGIC UNIT A4

SM

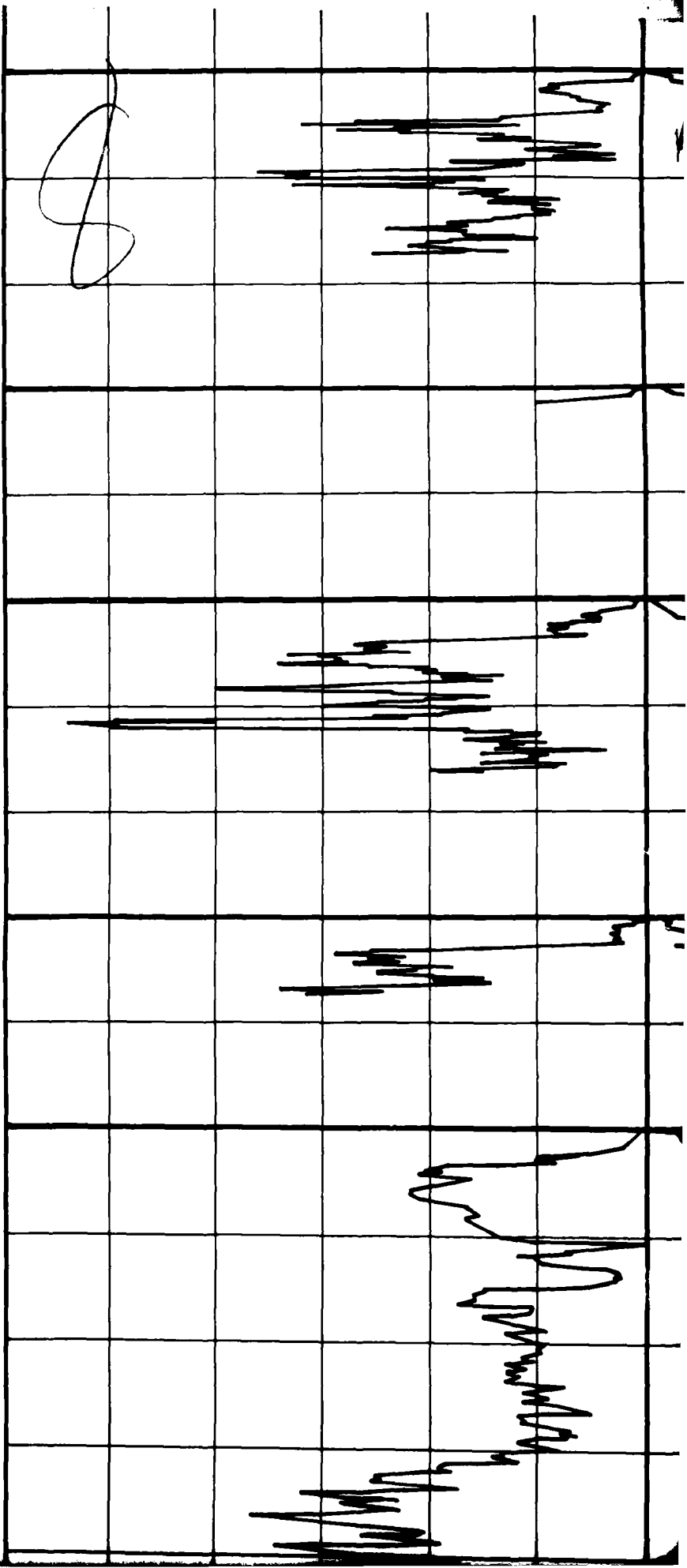
CS 49

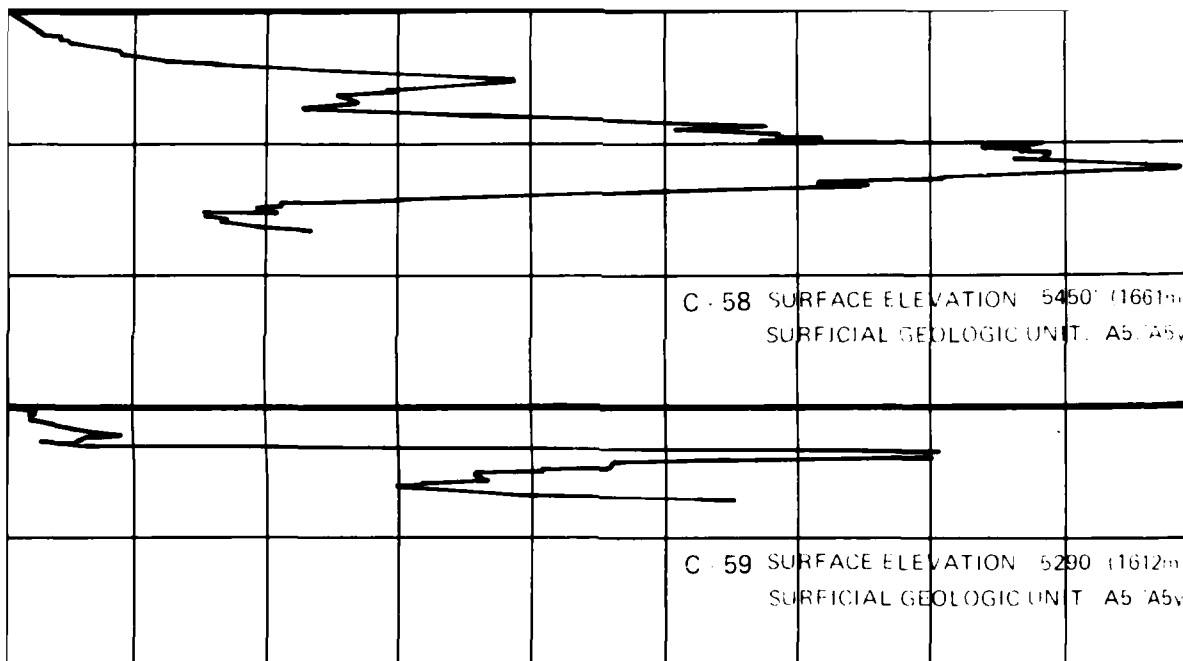


ION RATIO (8.2%)

ION RATIO (9.7%)

0 0
1 5
2 5
3 10
0 0
1 5
2 5
3 10
0 0
1 5
2 5
3 10
4 15
5 15
6 20





SM

CS 56

SM

P 13

SM

CS-58

GM

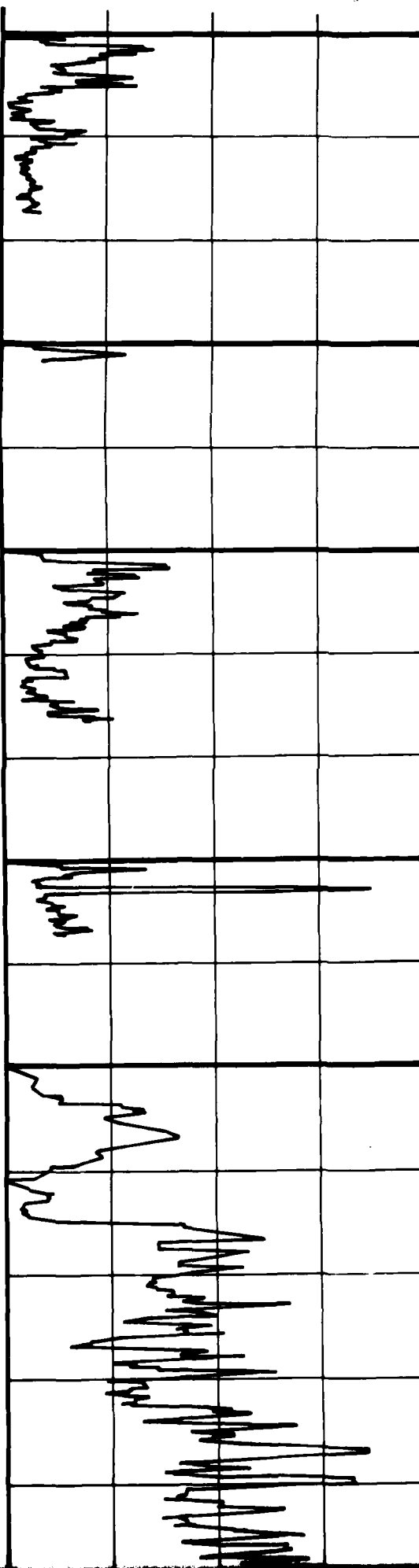
T 17

SM

GP

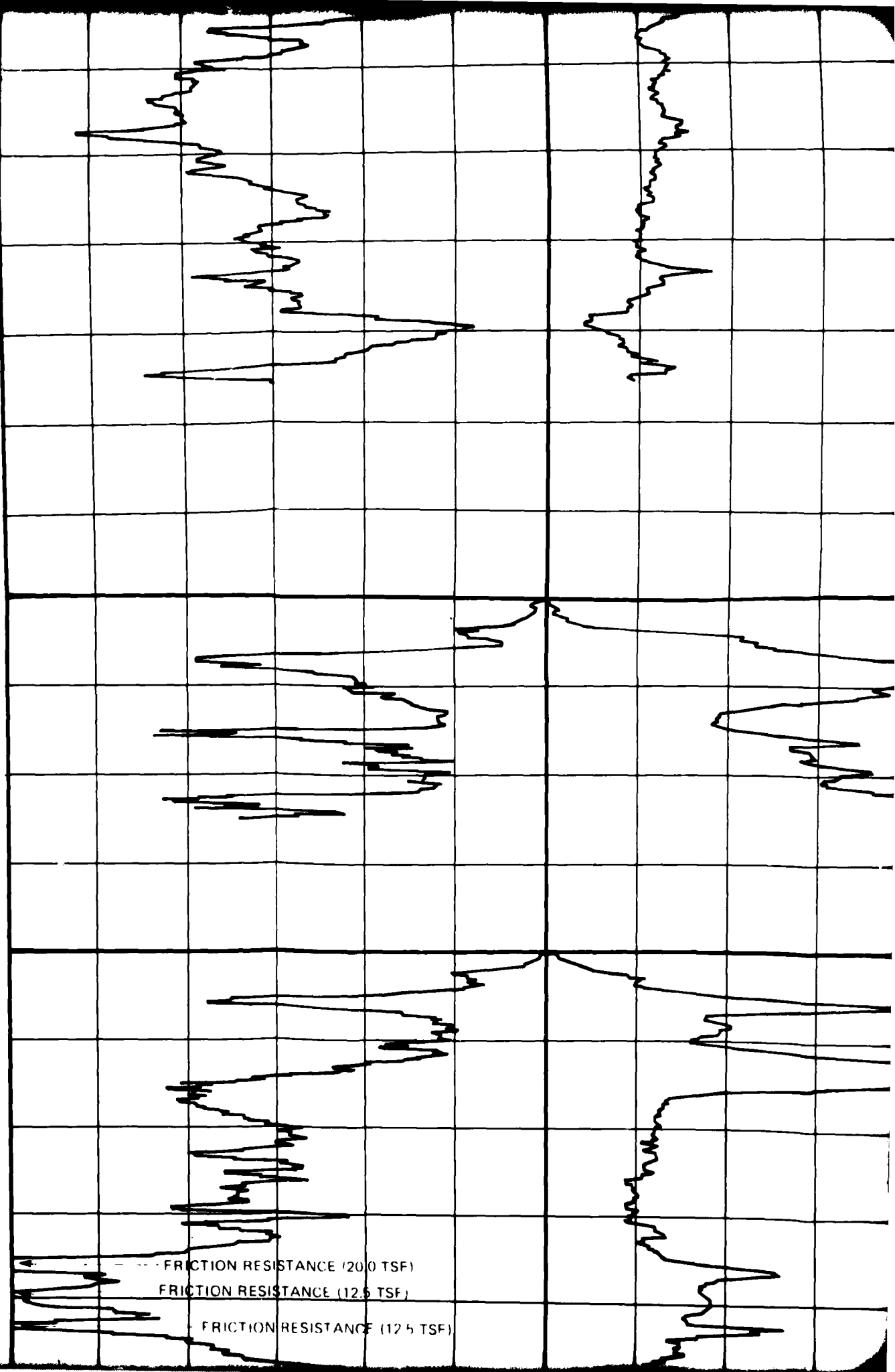
SM

P 17



70

4
5
6
7
8
9
10
15
20
25
30
35
0
1
2
3
4
5
0
1
2
3
4
5
6
7



--- FRICTION RESISTANCE (20.0 TSF)
--- FRICTION RESISTANCE (12.5 TSF)
--- FRICTION RESISTANCE (12.5 TSF)

12

C 49 SURFACE ELEVATION: 4700' (1433m)
SURFICIAL GEOLOGIC UNIT: A5, 'A4

C 50 SURFACE ELEVATION: 4735' (1443m)
SURFICIAL GEOLOGIC UNIT: A5, 'A4

SM

SW

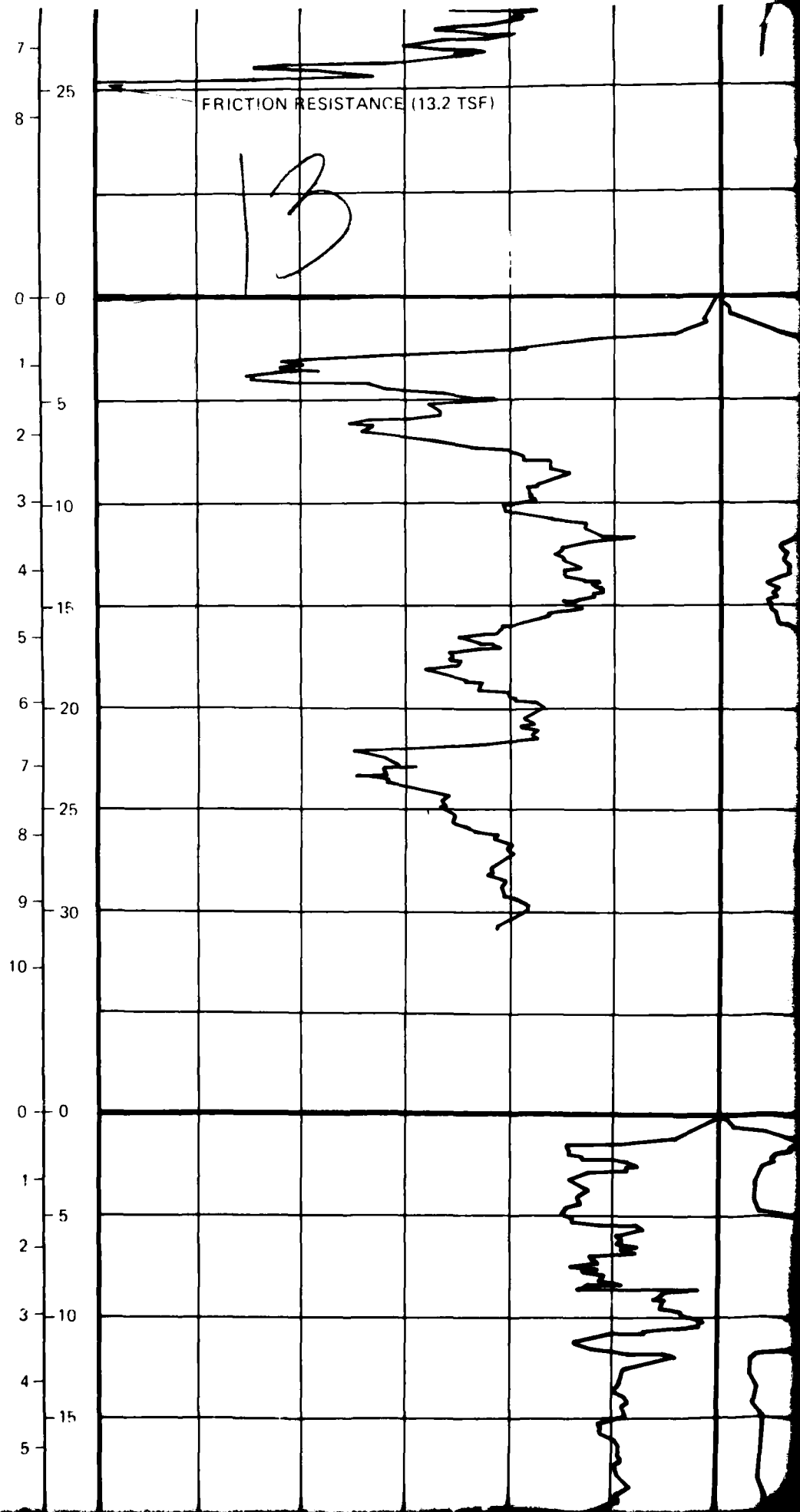
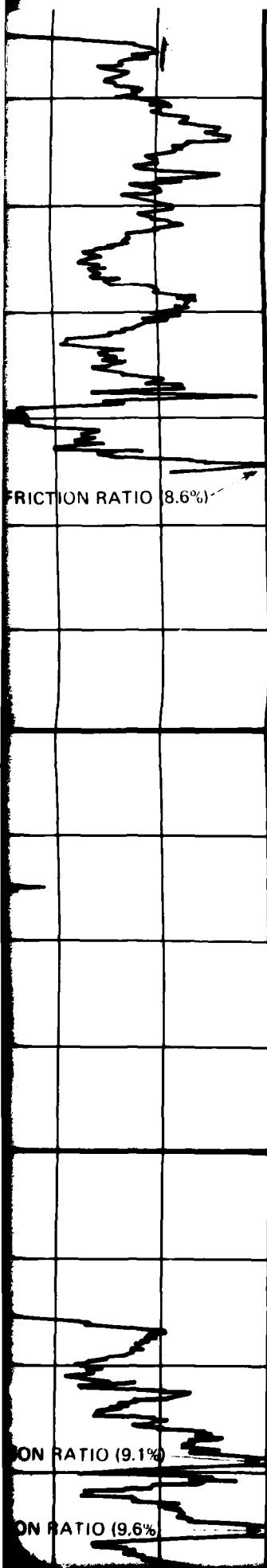
P-15

SM

FRICION RATIO 8.6

FRICION RATIO (9.1%)

FRICION RATIO (9.6%)



14

C - 60 SURFACE ELEVATION: 4750' (1448m)
SURFICIAL GEOLOGIC UNIT A4

SM

C - 61 SURFACE ELEVATION: 4675' (1425m)
SURFICIAL GEOLOGIC UNIT A4

MH

CH

SP

CL

ATION: 4750' (1448m)
GEOLOGIC UNIT: A4.

LEVATION: 4675' (1425m)
GEOLOGIC UNIT: A4.

SM

CS 61

MH

CH

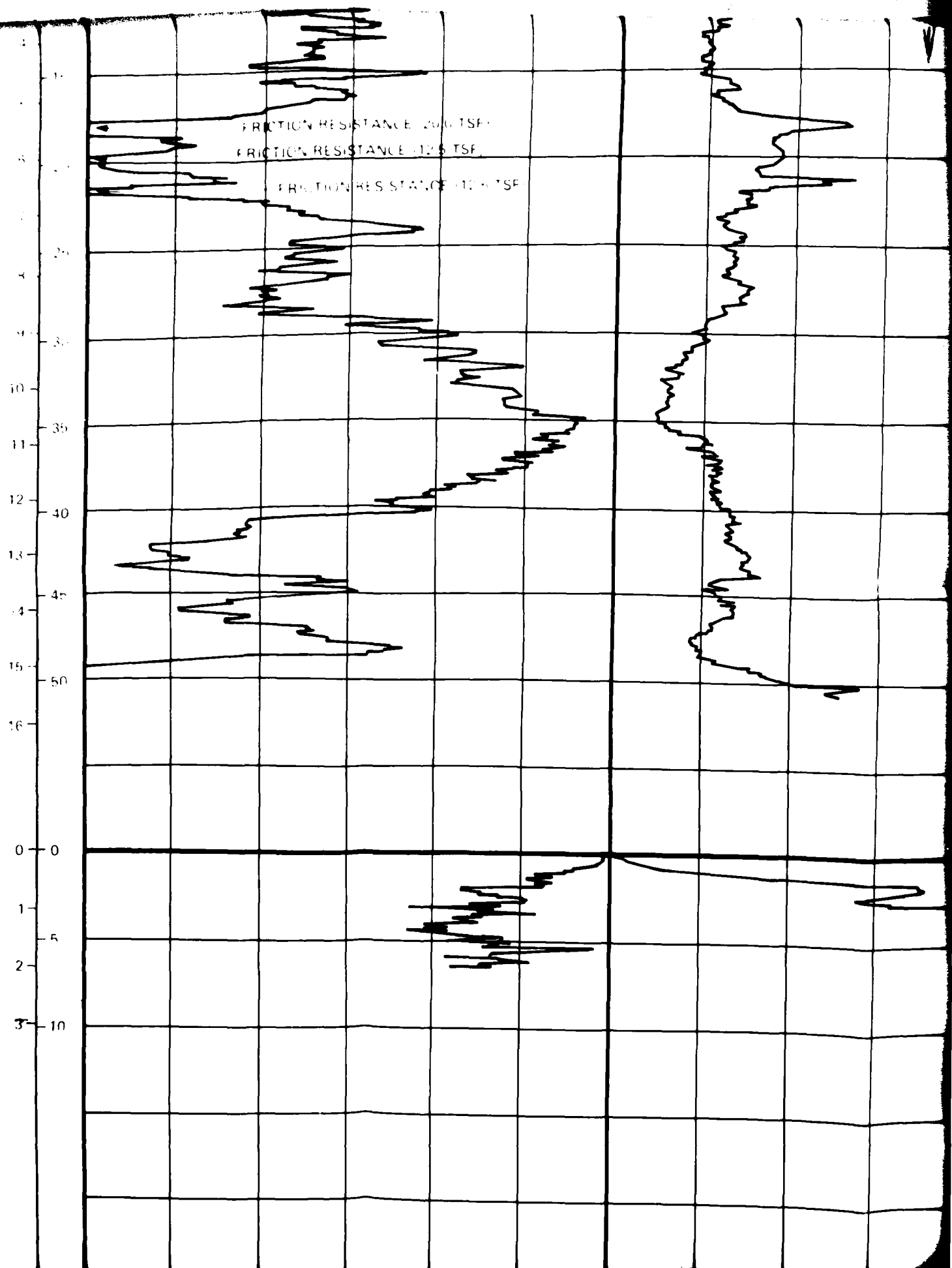
SP

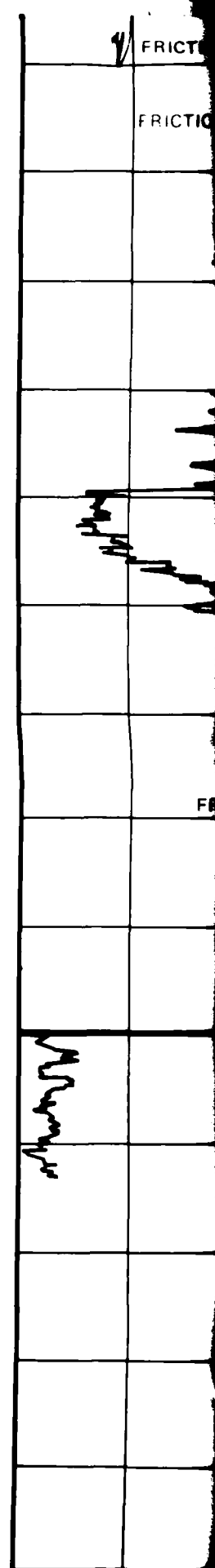
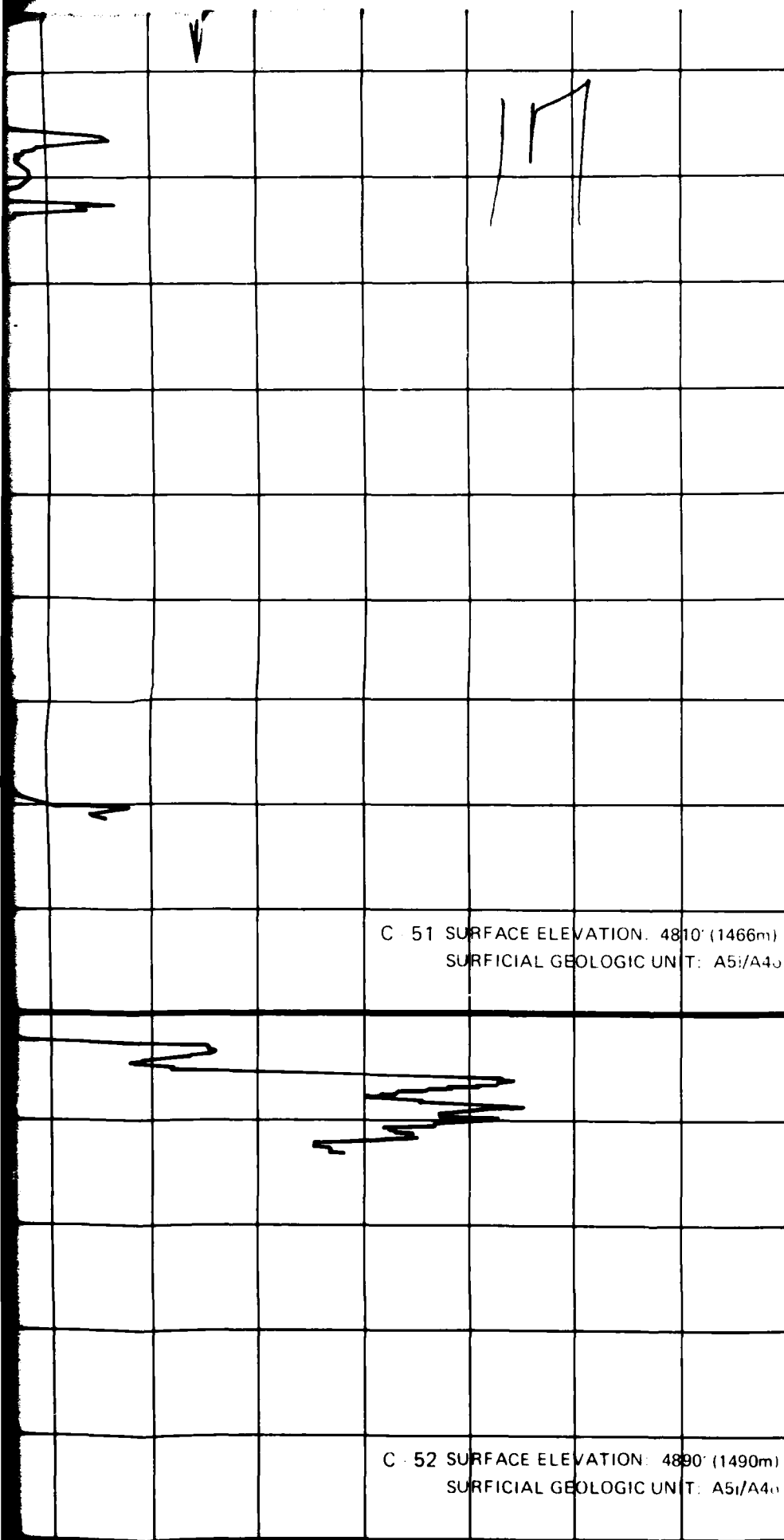
CL

FRICTION RATIO (10%)

15

16





1/ FRICTION RATIO (9.1%)

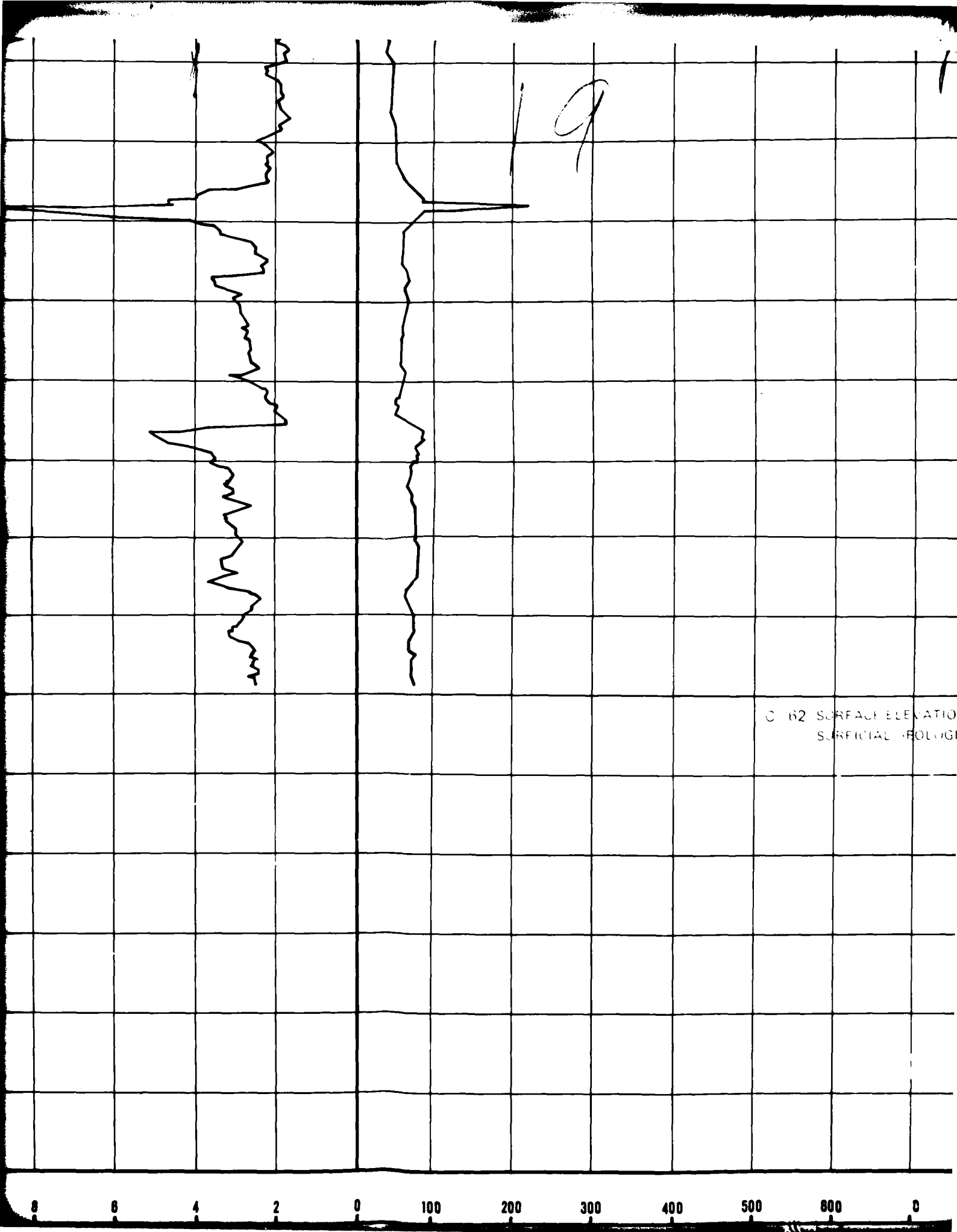
FRICTION RATIO (9.6%)

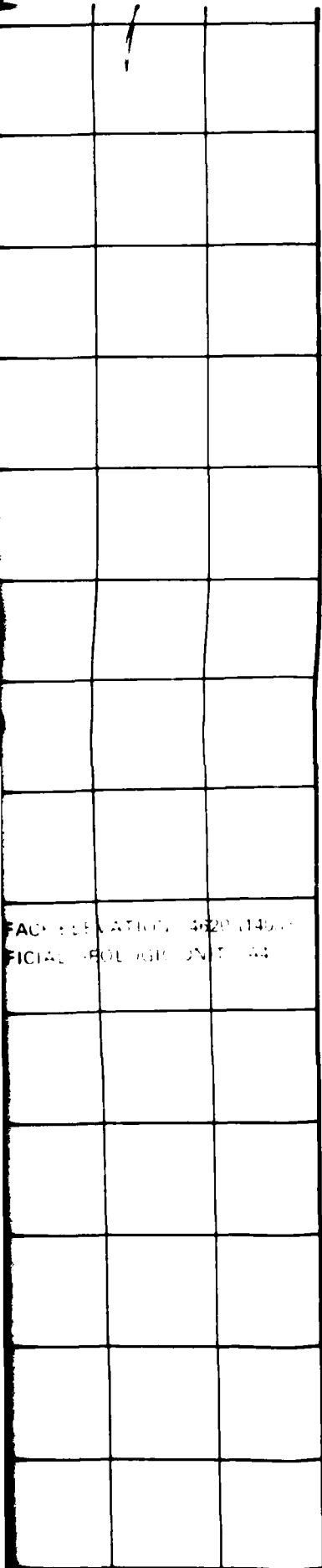
FRICTION RATIO (9.5%)

15
5
6
7
8
9
10
11
12
13
14
15
16
55

1

52

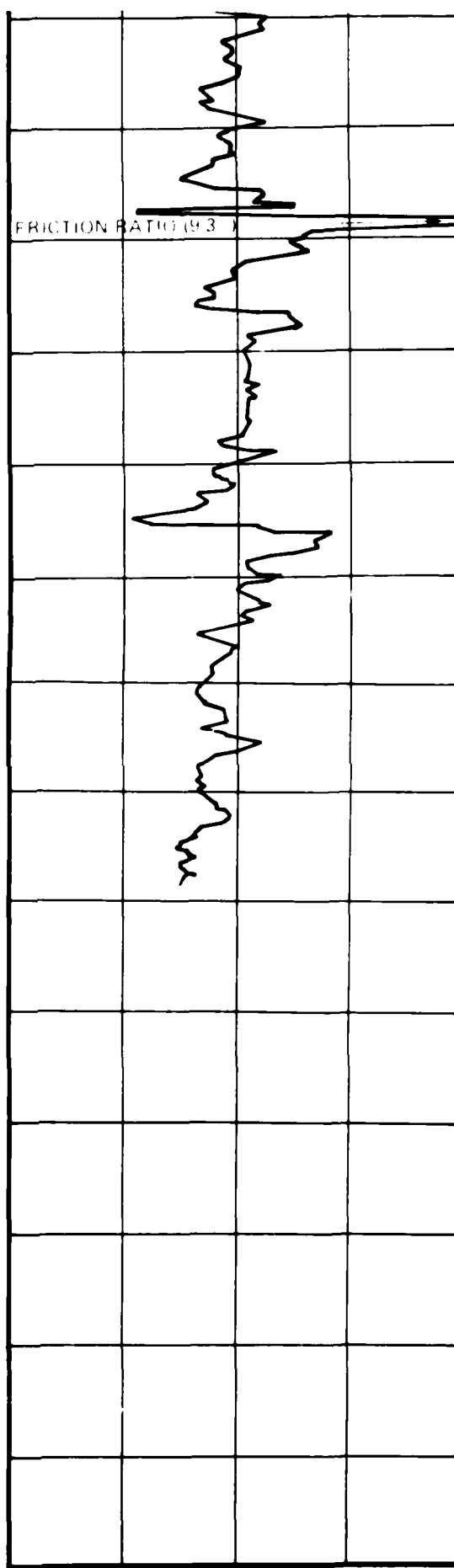




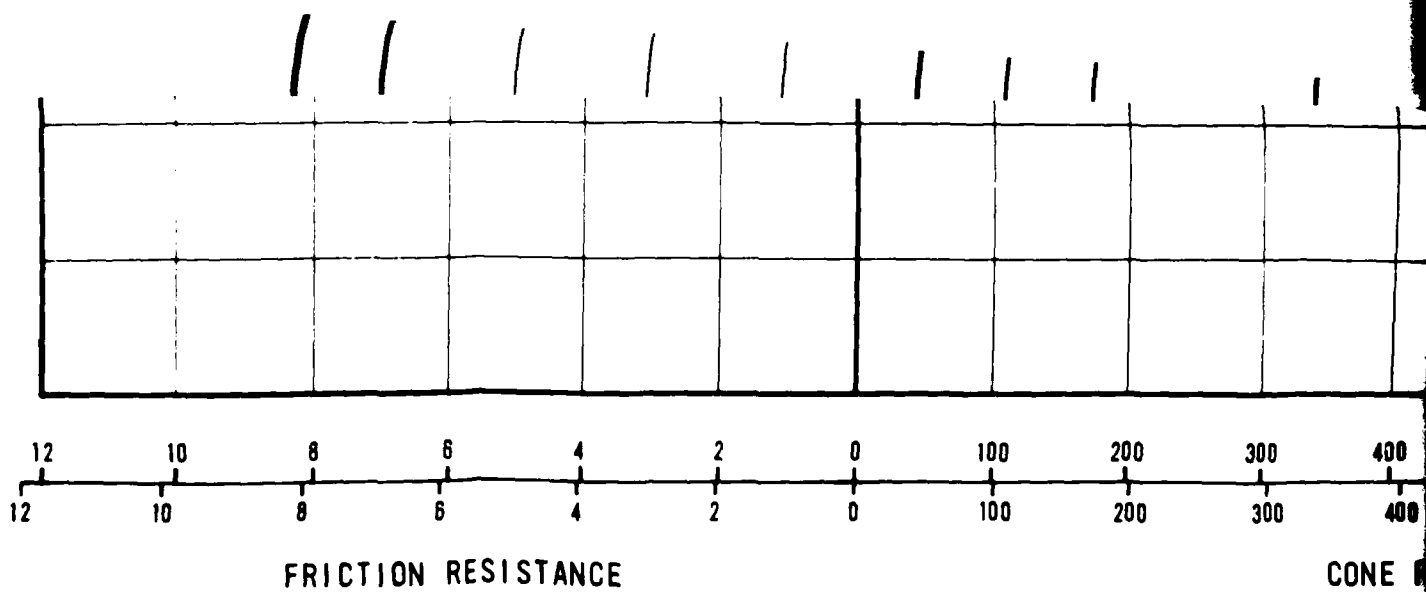
FACE ELEVATION 4620 (1450)
FICIAL PROLOGIC UNIT 44



B 7



180



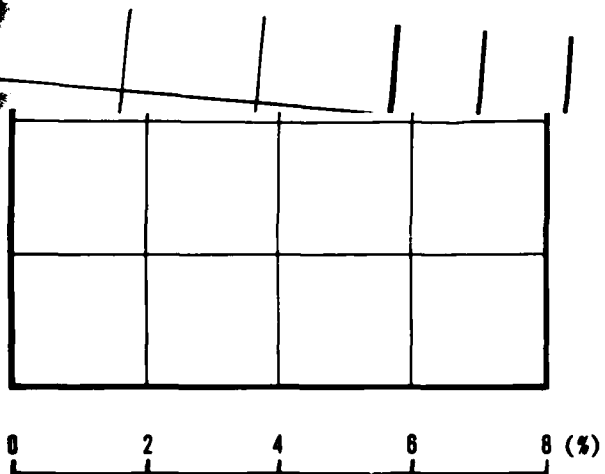
C 52 SURFACE ELEVATION 4890' (1490m)
SURFICIAL GEOLOGIC UNIT: A5i/A4i

200 300 400 500 600 700 800 900 (tsf)
200 300 400 500 600 700 800 900 (kg/cm²)

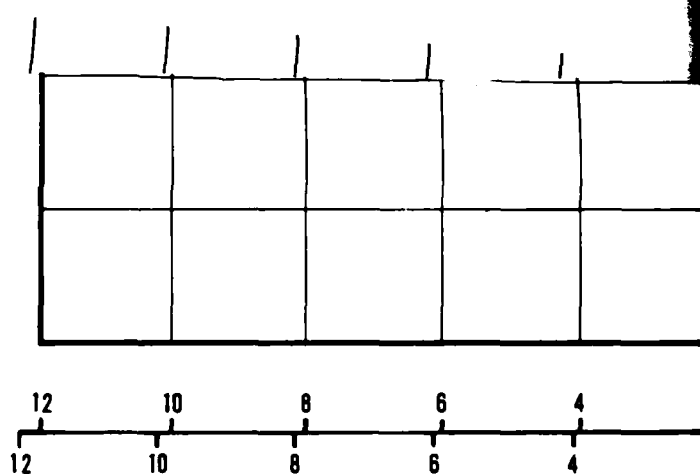
CONE RESISTANCE

0 2
FRICT

22

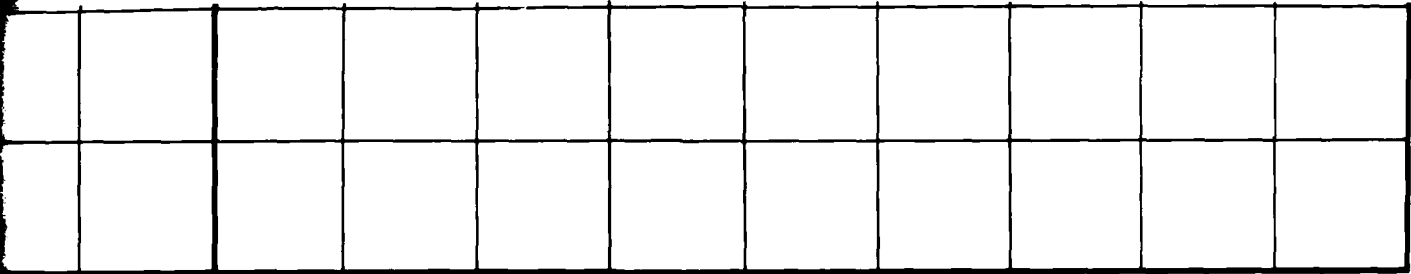


FRICTION RATIO



FRICTION RESISTANCE

23



2 0 100 200 300 400 500 600 700 800 900 (tsf)
2 0 100 200 300 400 500 600 700 800 900 (kg/cm²)

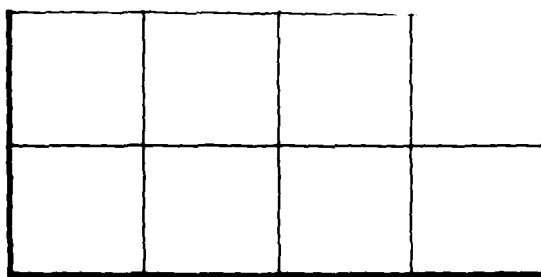
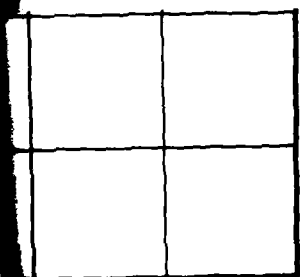
CONE RESISTANCE

1

24

C

DE



700 800 900 (tsf)
700 800 900 (kg/cm²)

0 2 4 6 8 (%)

FRICTION RATIO

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CONE PENETROMETER TEST RESULTS
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II-10-1
3 OF 4

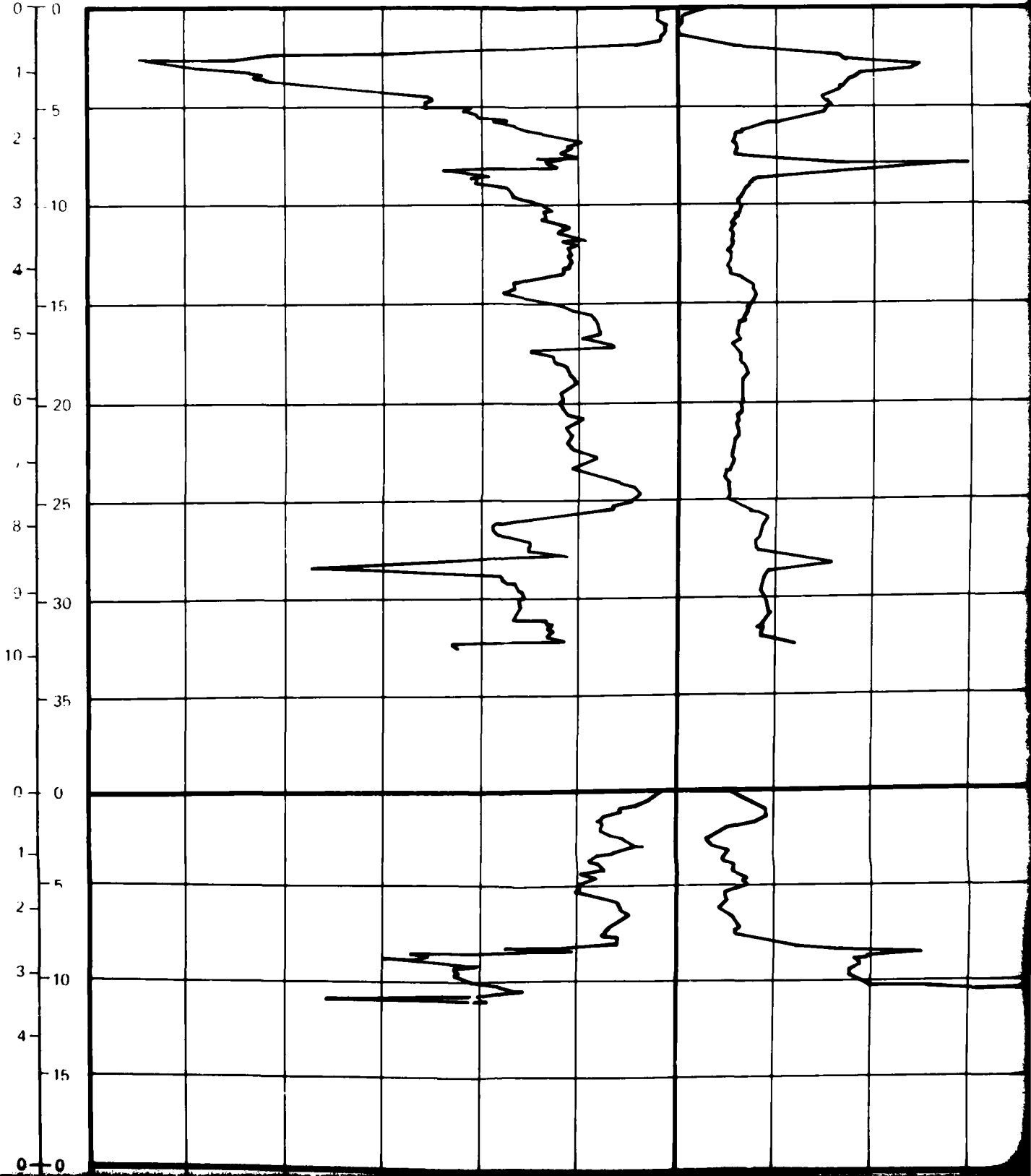
FUGRO NATIONAL, INC.

FRICTION RESISTANCE

DEPTH

(METERS)
(FEET)

12 10 8 6 4 2 0 100 200 300
12 10 8 6 4 2 0 100 200 300



CONE RESISTANCE

300 400 500 600 700 800 900 (kg/cm²)
 300 400 500 600 700 800 900 (tsf)

FRICTION RATE

0 2 4

SOIL
COLUMN

SM

CS 63

C - 63 SURFACE ELEVATION: 4680' (1426m)
 SURFICIAL GEOLOGIC UNIT: A40

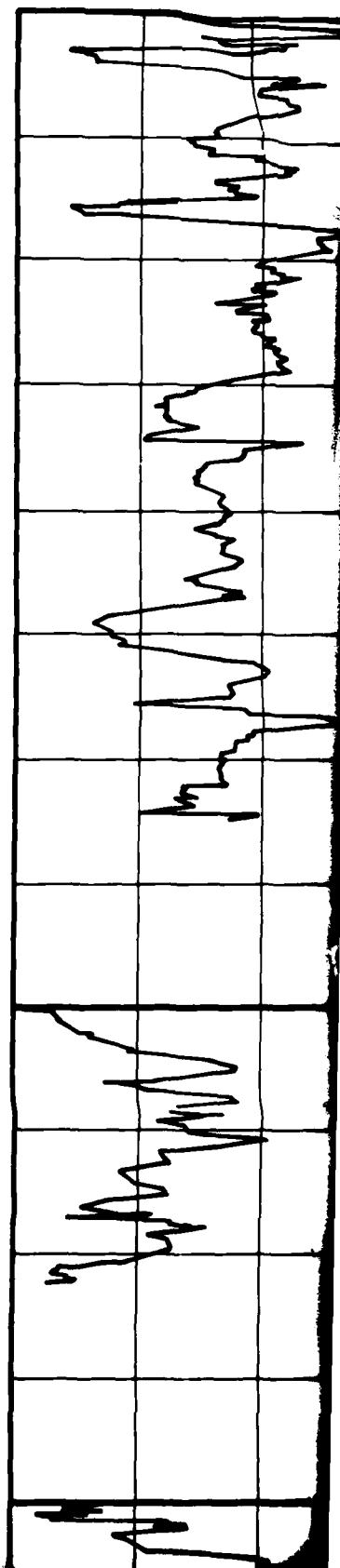
SP.
SM

SM

P 18

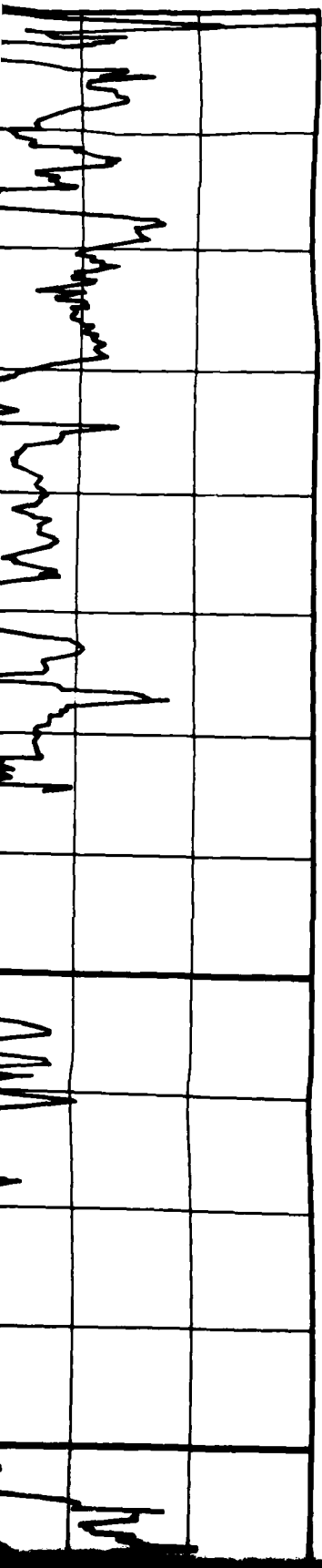
C 64 SURFACE ELEVATION: 4720' (1439m)
 SURFICIAL GEOLOGIC UNIT: A40

SM
CL



CTION RATIO

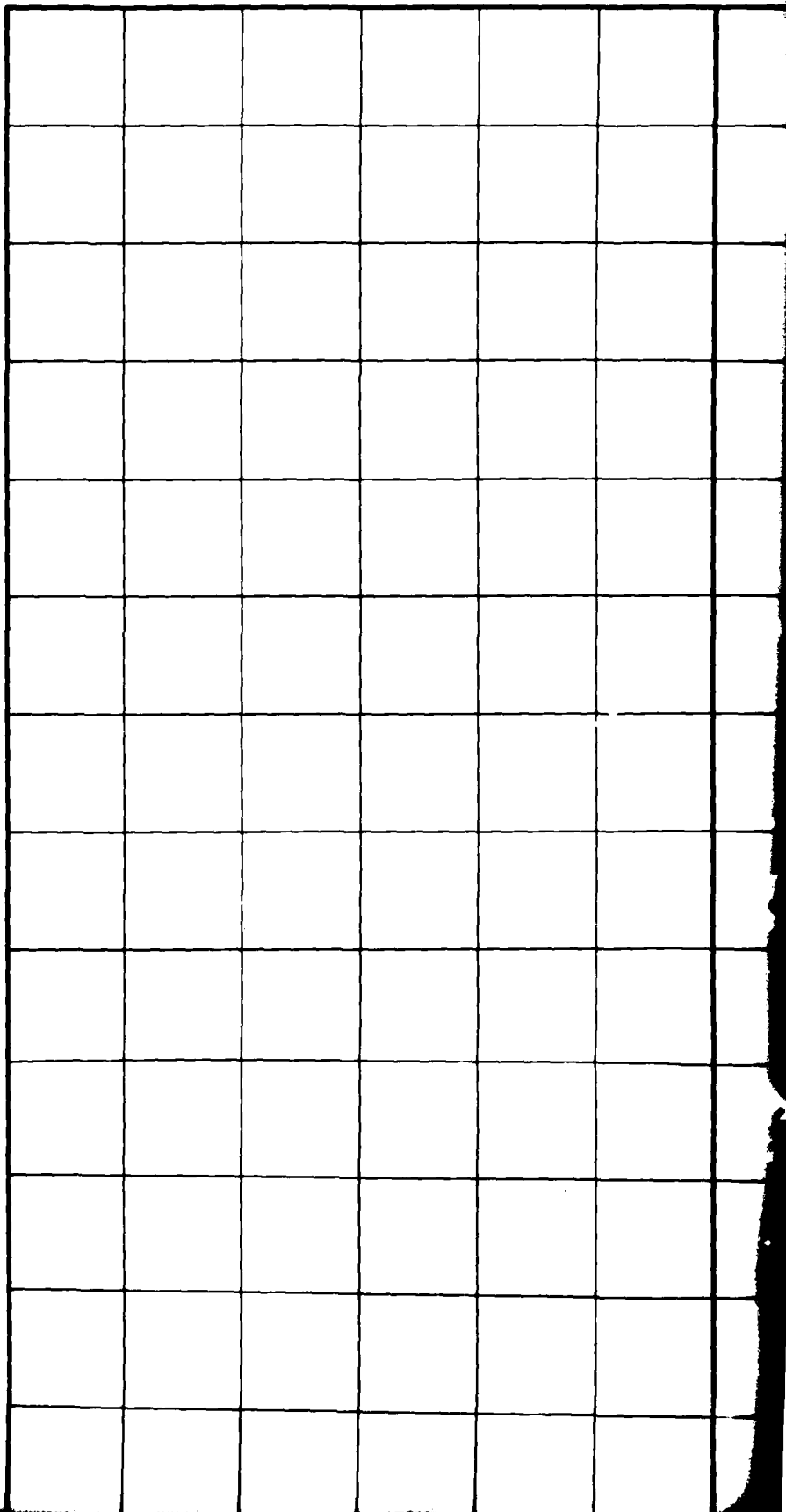
4 6 8 (%)



FRICTION RESISTANCE

DEPTH

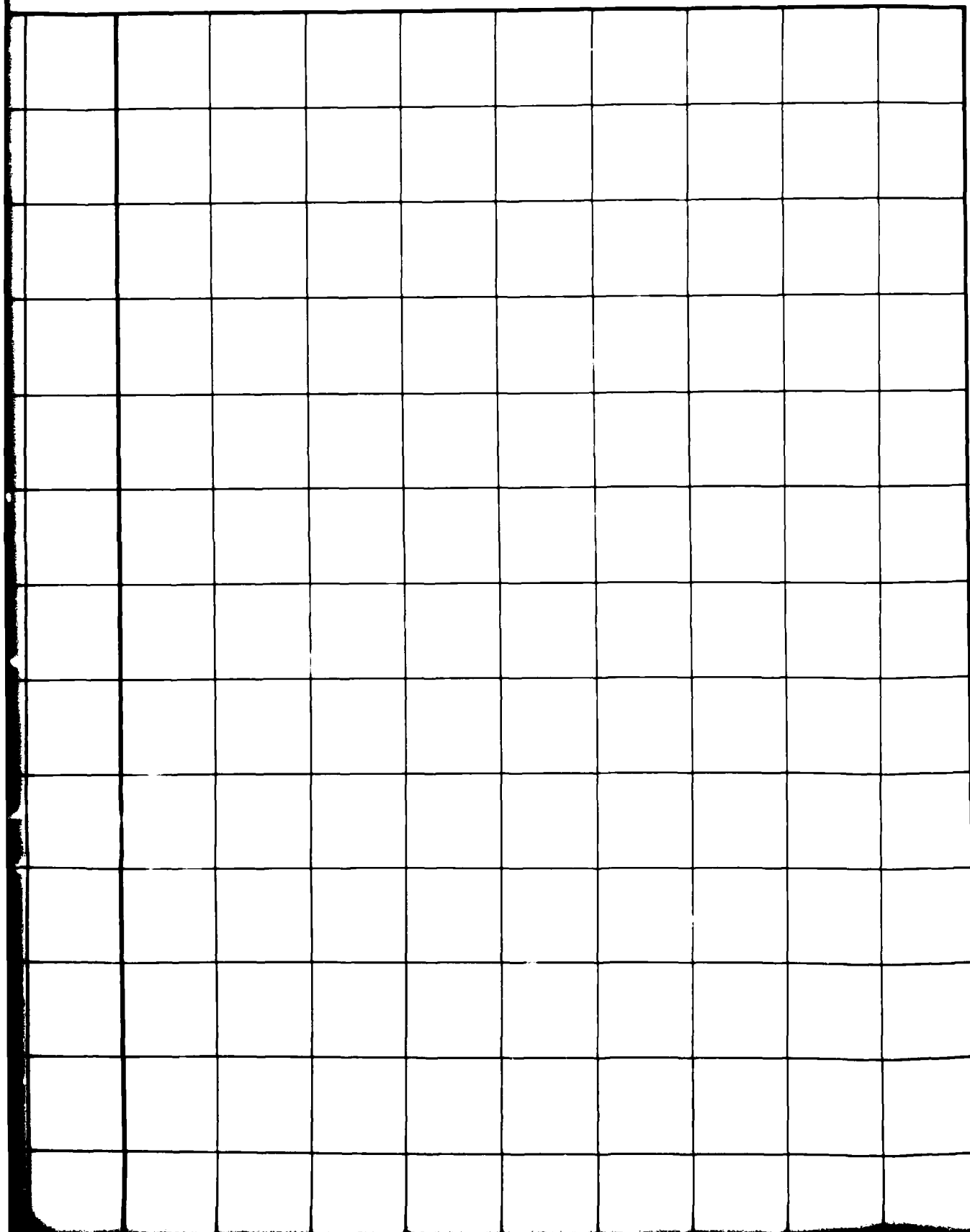
(METERS) (FEET) 12 10 8 6 4 2 0



CONE RESISTANCE

2 0 100 200 300 400 500 600 700 800 900 (kg/cm²)
2 0 100 200 300 400 500 600 700 800 900 (tsf)

SOIL
COLUMN



FRICTION RATIO

800

900 (kg/cm²)

800

900

(tsf)

**SOIL
COLUMN**

0

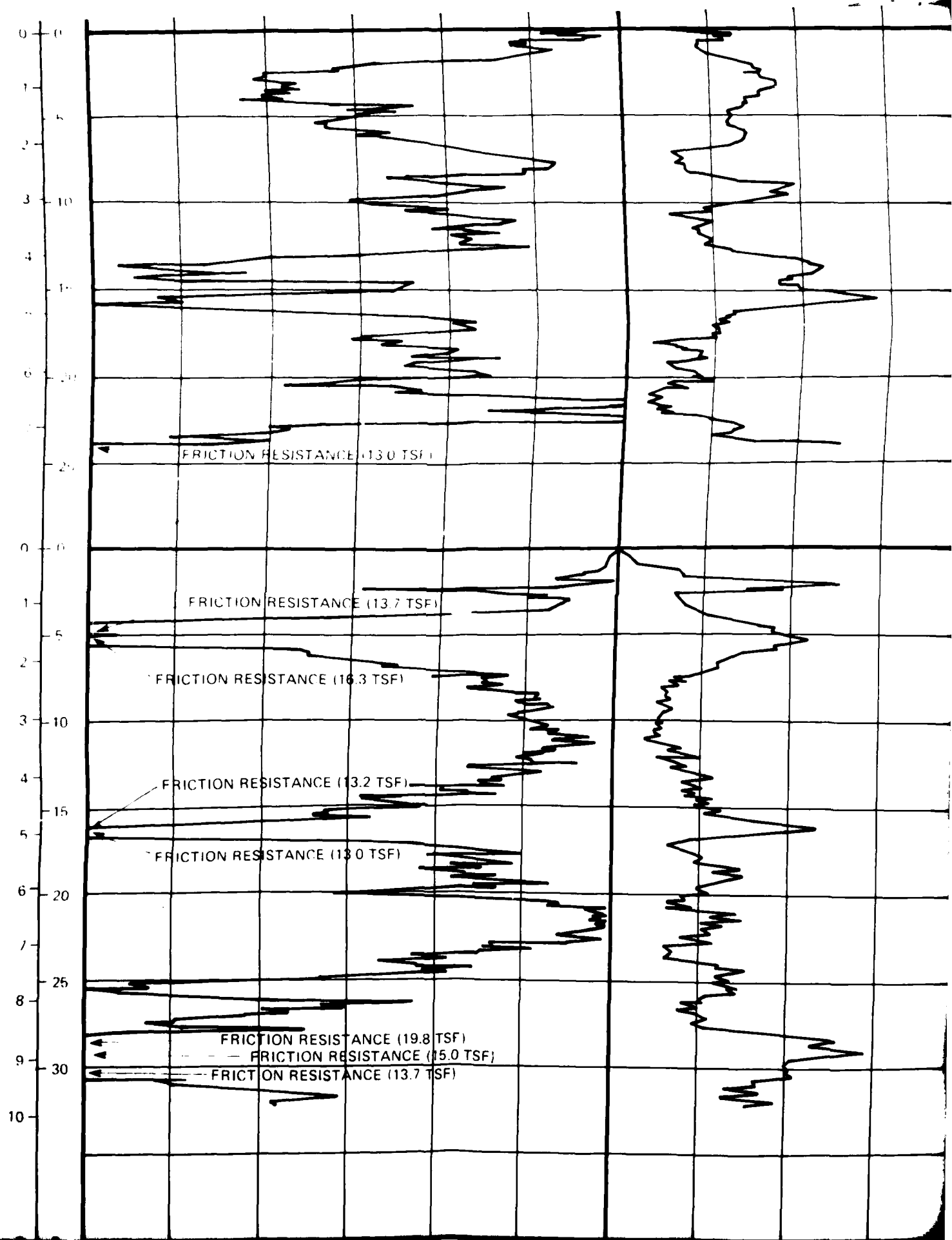
2

4

6

8 (%)

1
6



7

C - 65 SURFACE ELEVATION: 4730' (1442m)
SURFICIAL GEOLOGIC UNIT: A4

C - 66 SURFACE ELEVATION: 4720' (1439m)
SURFICIAL GEOLOGIC UNIT: A4

SM
CL

CS 65

GP
GM
CL

P 19

SM

FRICITION RATIO 7.14%
FRICITION RATIO (10.6%)
FRICITION RATIO

FRICITION RATIO 8.2

FRICITION RATIO (1

8

FRICION RATIO (7.14%)

FRICION RATIO (10.6%)

FRICION RATIO (7.14%)

FRICION RATIO (8.4%)

FRICION RATIO (10.0%)

AD-A113 393

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VERIFICATION STUDY - WAH WAH VALLEY, UTAH. VOLUME II. GEOTECHNI--ETC(U)
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F/6 13/2

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NL

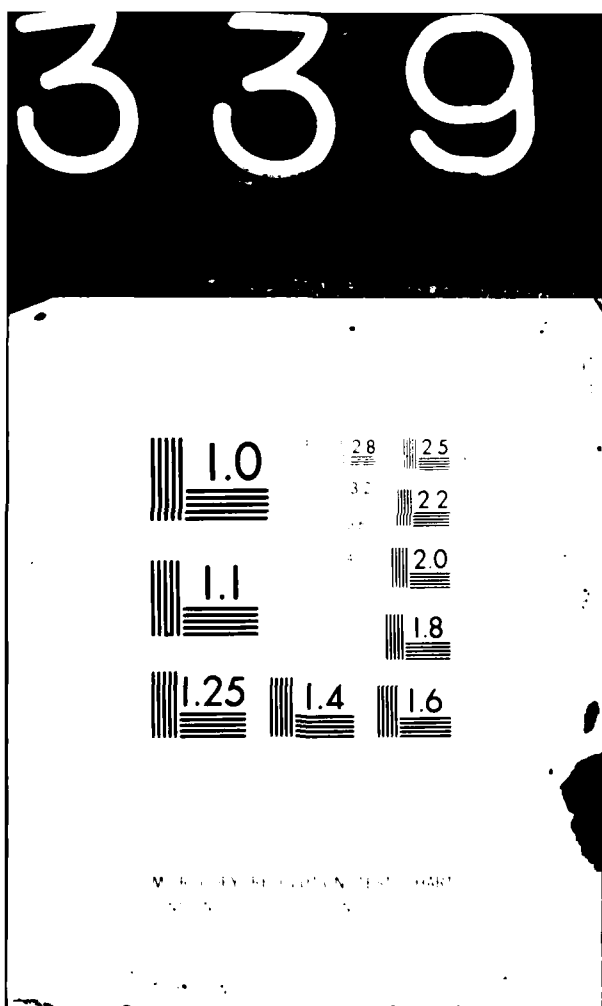
4

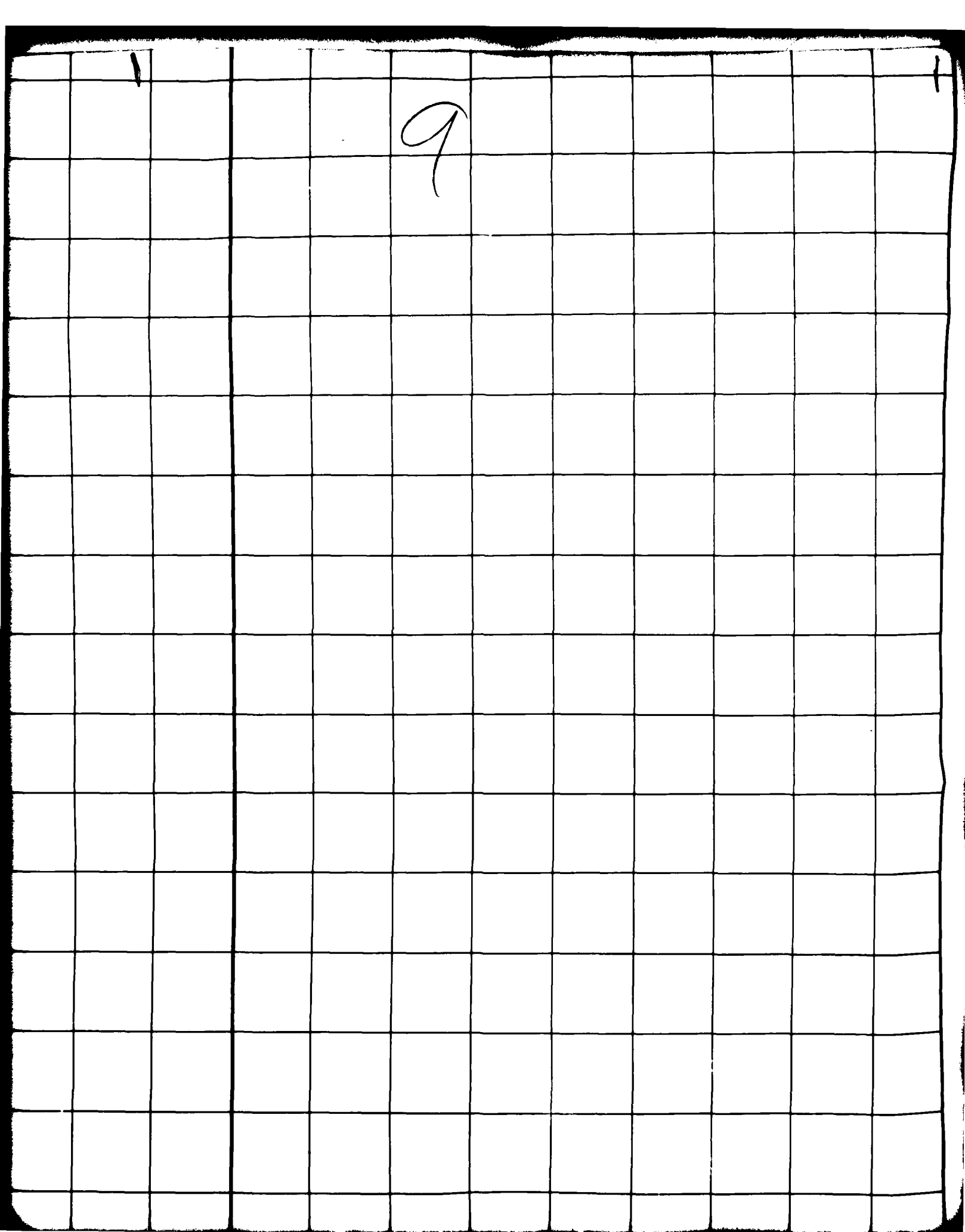
411 A

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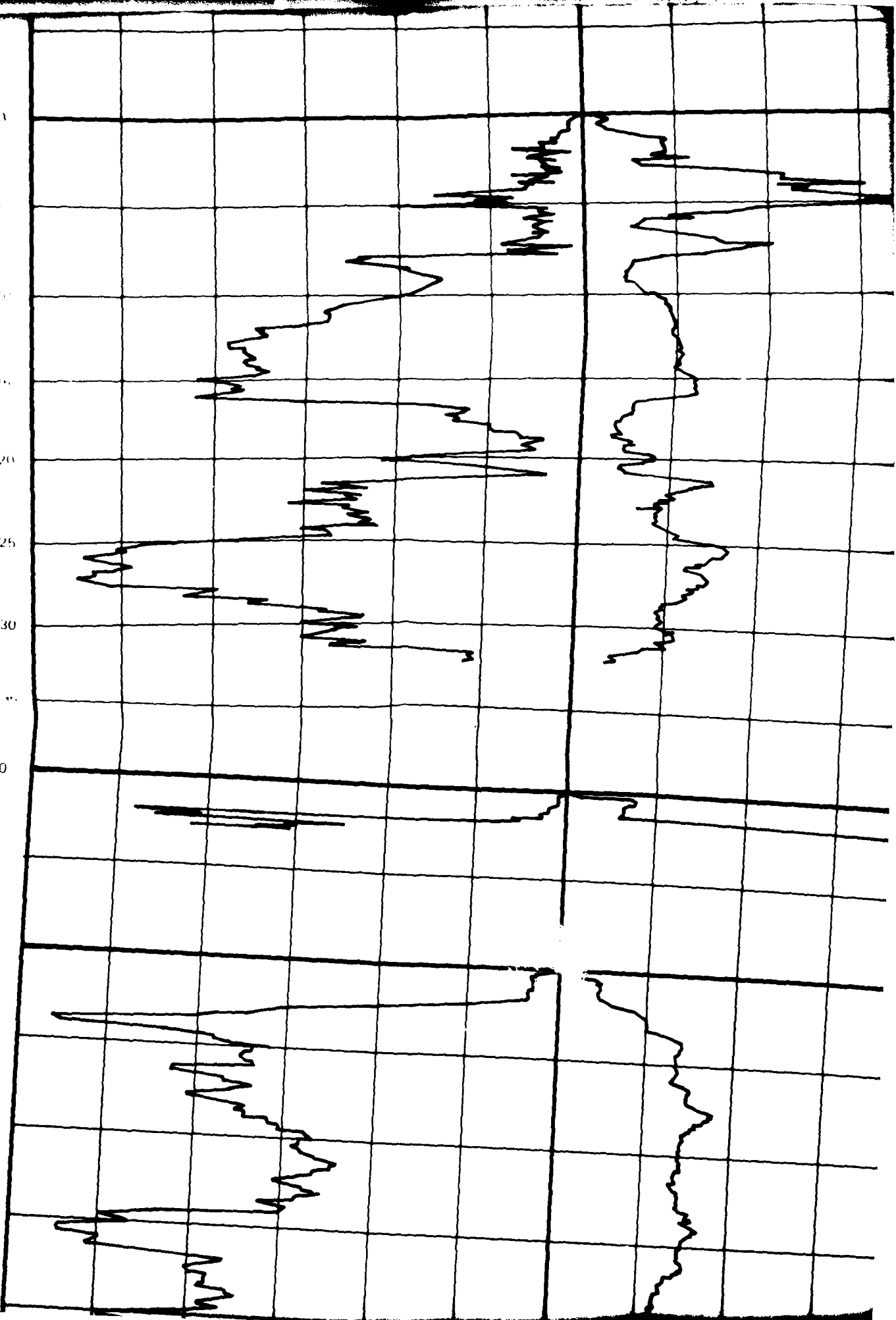
16-82
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0 0
1
2
3 10
4 15
5 20
6 25
7 30
8
9
10
11
12 0
13 0
14 5
15 10
16 15
17 20



C - 66 SURFACE ELEVATION: 4720' (1439m)
SURFICIAL GEOLOGIC UNIT: A4u

12

C - 67 SURFACE ELEVATION: 4730' (1442m)
SURFICIAL GEOLOGIC UNIT: A4u

C - 68 SURFACE ELEVATION: 4840' (1475m)
SURFICIAL GEOLOGIC UNIT: A4u

SM

CS 67

SM

SP

SM

T 20

SM

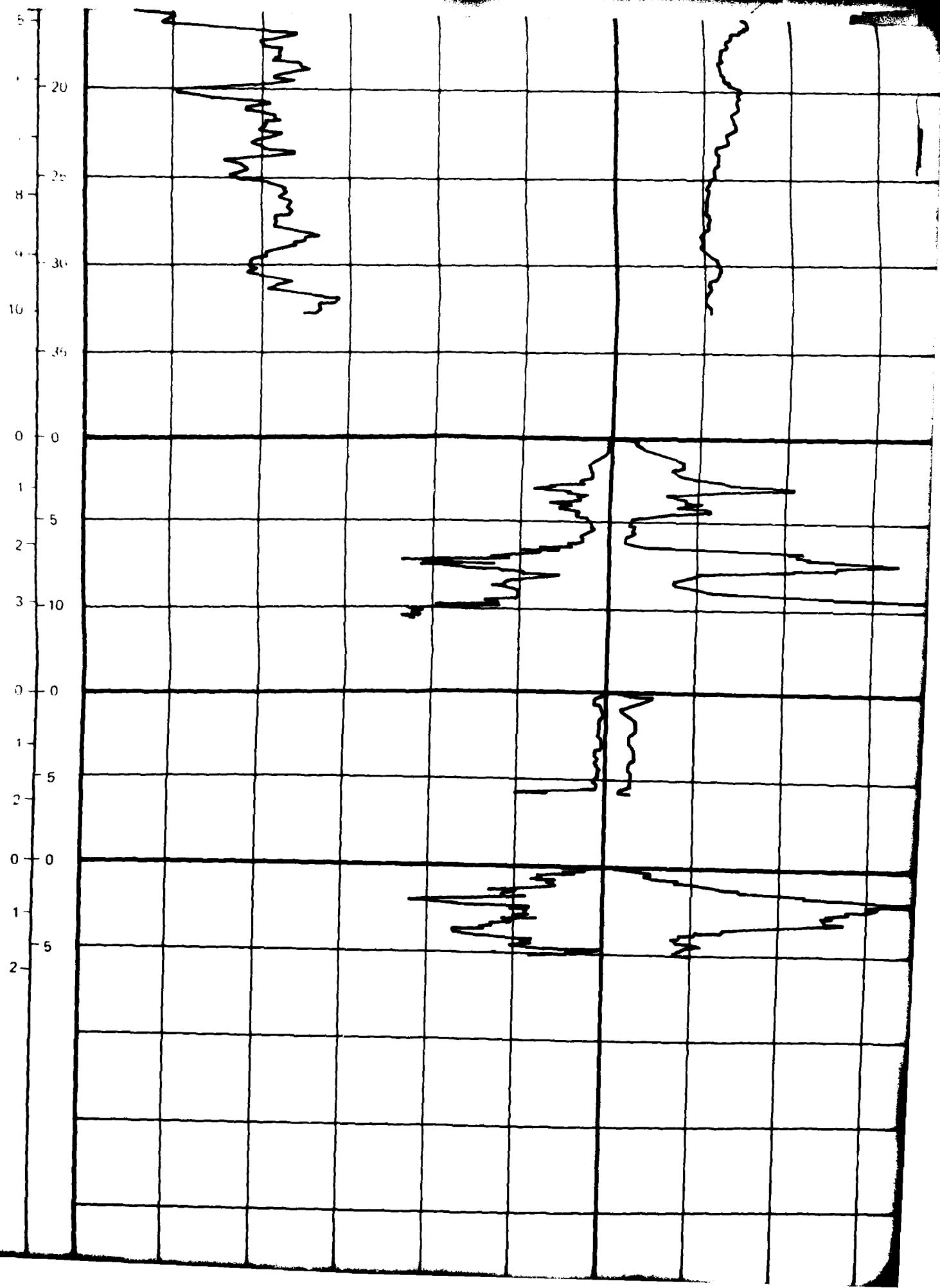
CH

CS-69

1

14

16



17

C 69 SURFACE ELEVATION: 4760' (1451m)
SURFICIAL GEOLOGIC UNIT: A4c

C 70 SURFACE ELEVATION: 4720' (1439m)
SURFICIAL GEOLOGIC UNIT: A4c

C 71 SURFACE ELEVATION: 4720' (1439m)
SURFICIAL GEOLOGIC UNIT: A4c

C 72 SURFACE ELEVATION: 5565' (1696m)
SURFICIAL GEOLOGIC UNIT: A5i

SM

SP

P 20

SM

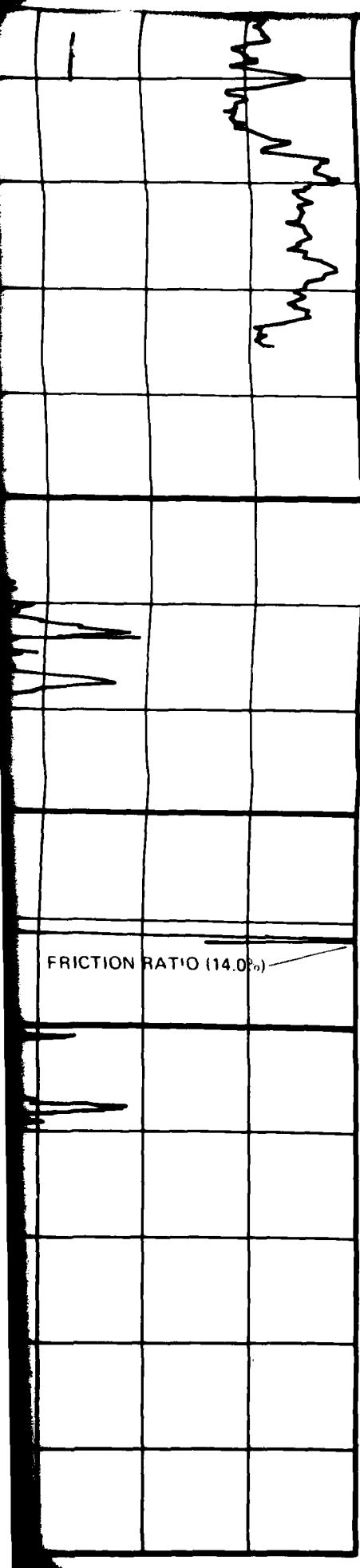
ML

CS 71

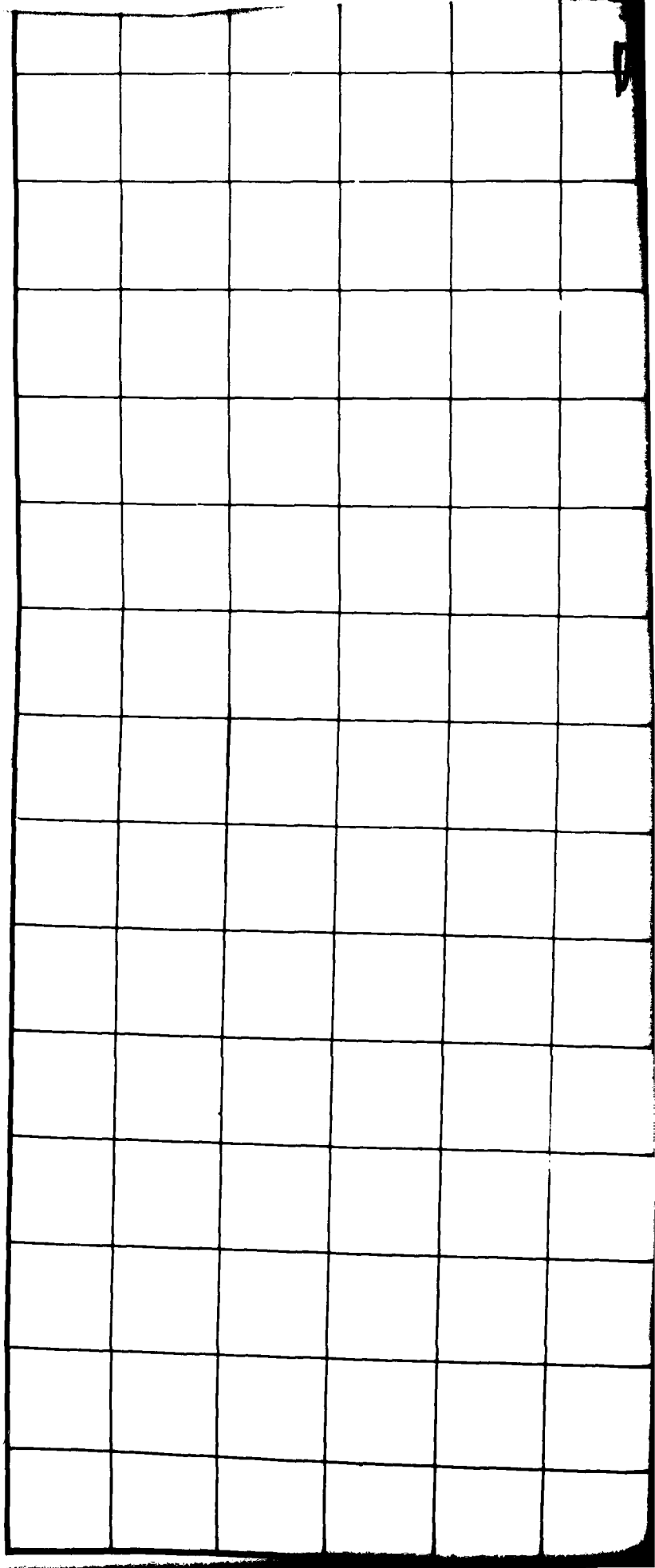
FRICTION

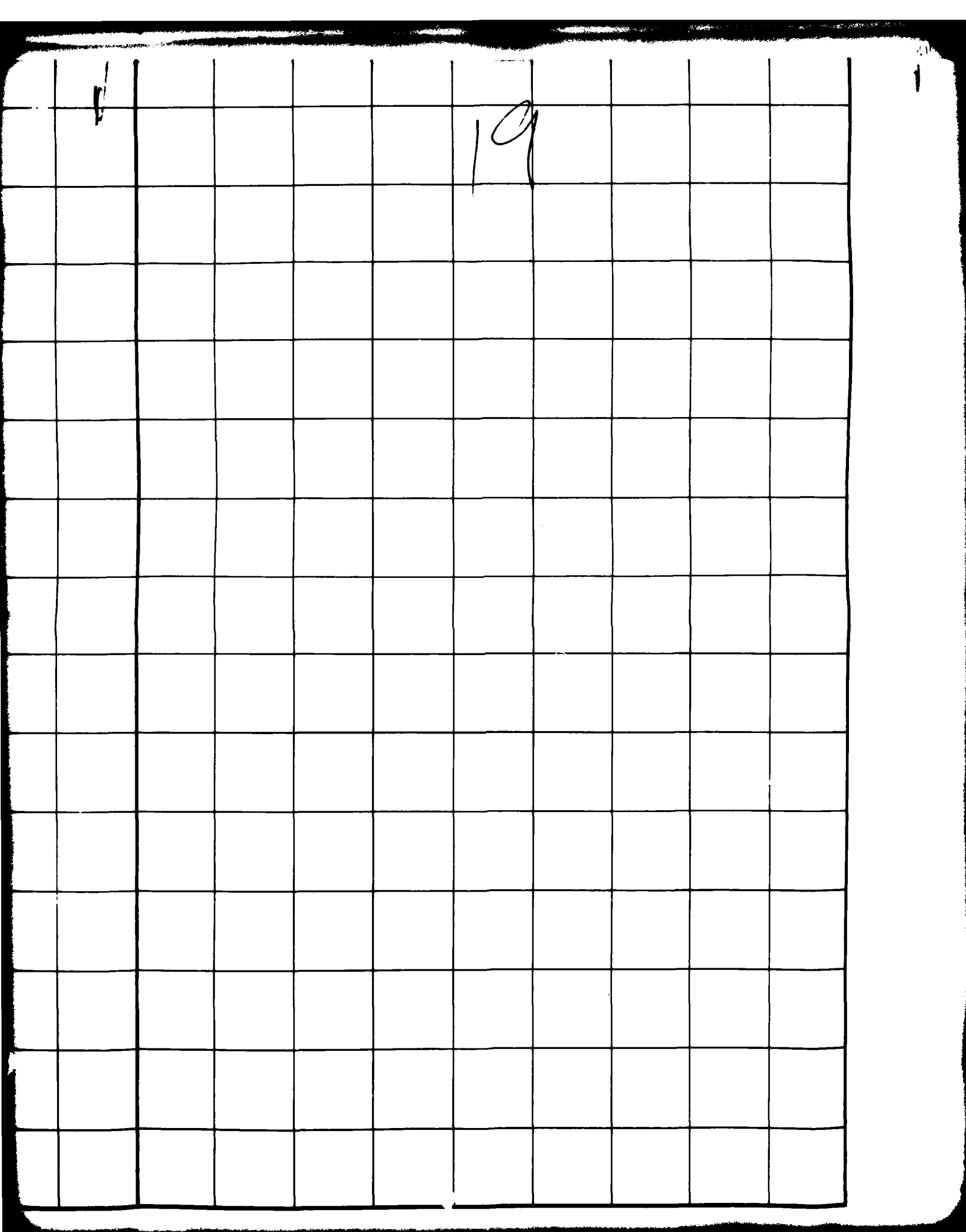
GM

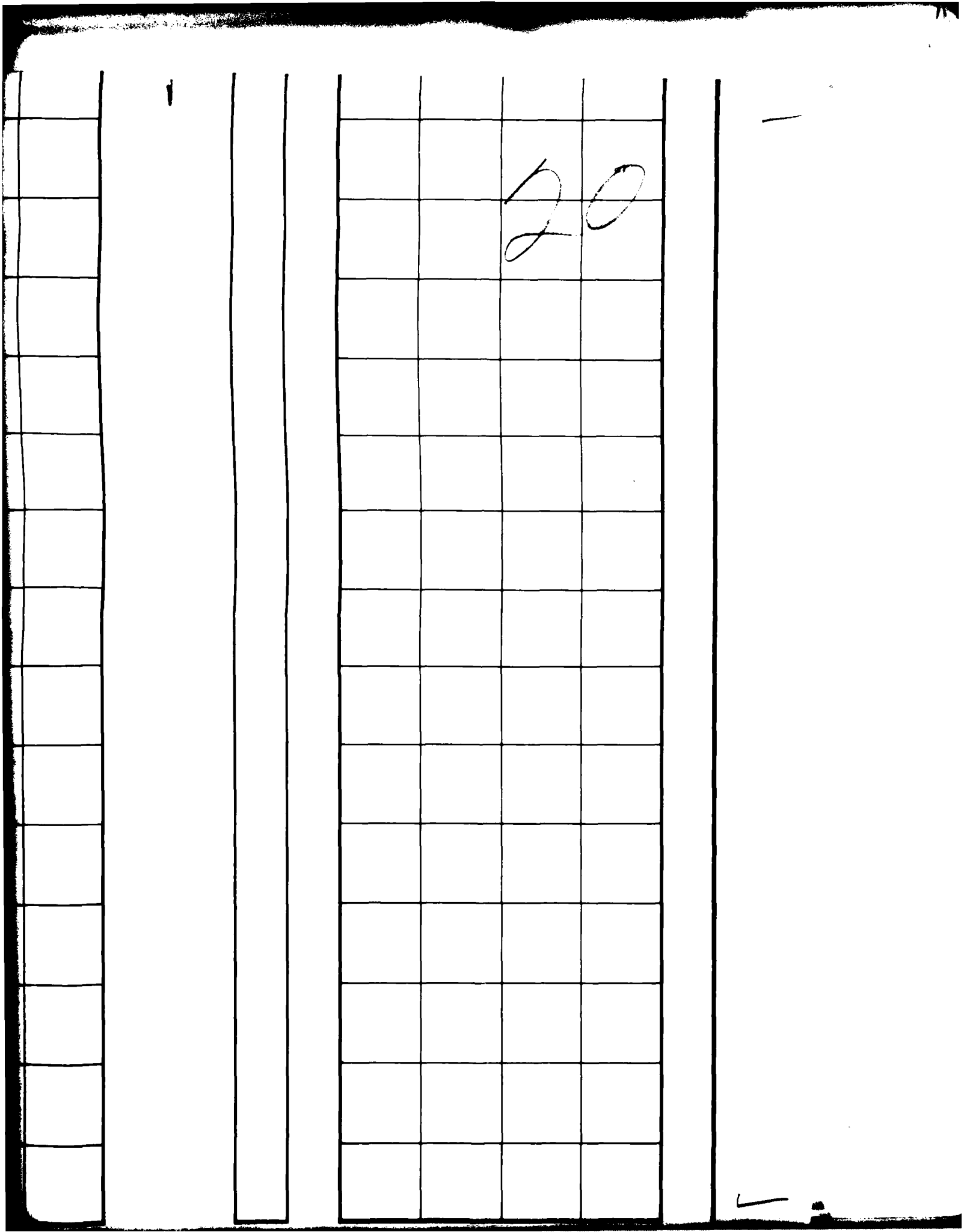
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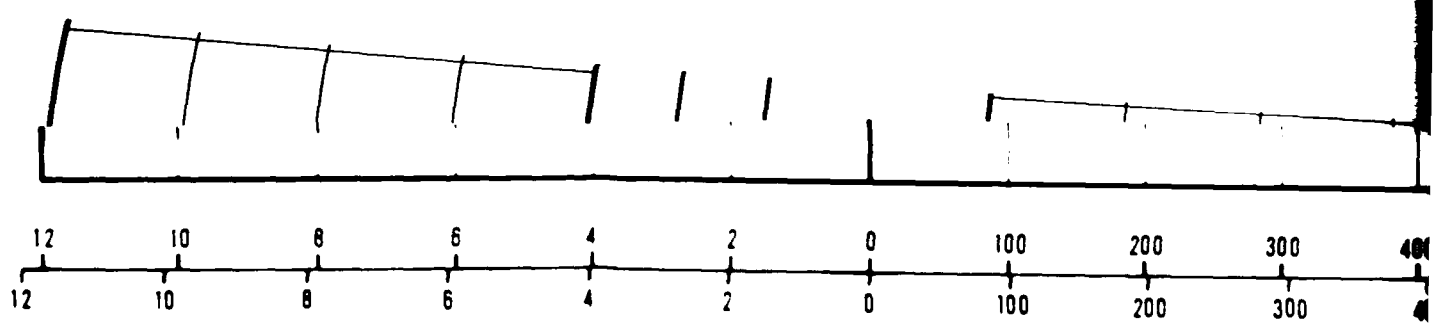
18







20



FRICTION RESISTANCE

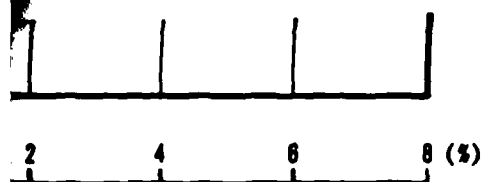
CONE

300 400 500 600 700 800 900 (tsf)
300 400 500 600 700 800 900 (kg/cm²)

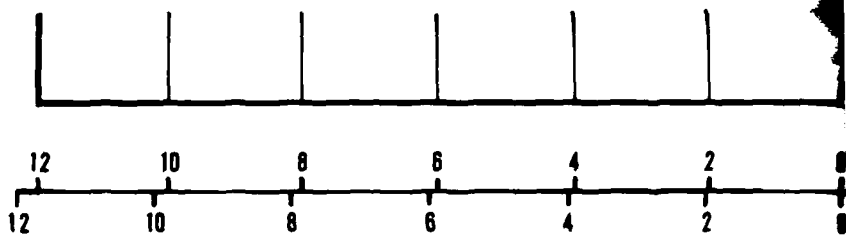
CONE RESISTANCE

0 2 4

FRICTION

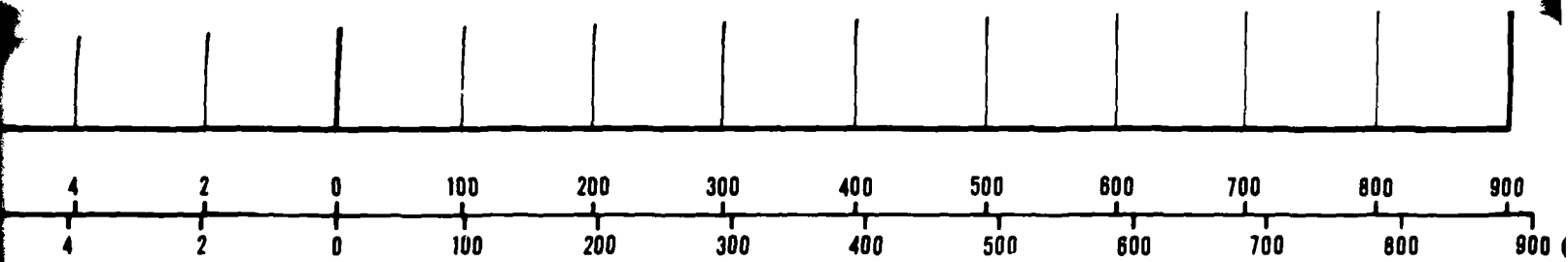


FRICTION RATIO



FRICTION RESISTANCE

23



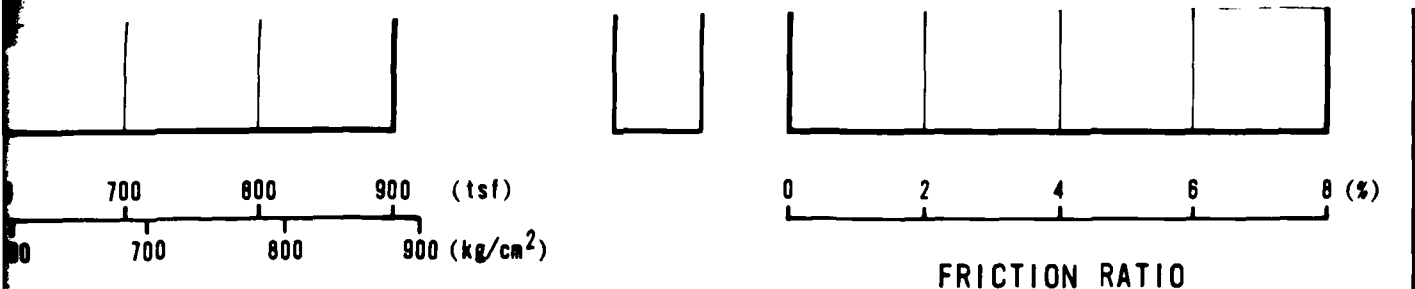
STANCE

CONE RESISTANCE

1

24

1



CONE PENETROMETER TEST RESULTS
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